

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES

ANNUAL MANAGEMENT REPORT

1976

PRINCE WILLIAM SOUND AREA
REGION II

Submitted by: Ralph B. Pirtle

February 9, 1978

ACE 1909712

TABLE OF CONTENTS

	<u>Page</u>
Preface	i
Personnel	ii
List of Tables	iii
List of Figures	v
Introduction	1
District Salmon Fishery	
Bering River District	
Introduction	9
Sockeye Salmon	9
Coho Salmon	9
Escapement	9
Copper River District	
Introduction	12 a
Sockeye Salmon	12 a
King Salmon	15
Coho Salmon	15
Escapement	15
Subsistency Fishery	18
Prince William Sound Districts	
Introduction	23
General District, Purse Seine Fishery	23
Escapement	23
Coghill and Unakwik Districts	
District Descriptions	34
Commercial Fishery	34
Escapement	34
Eshamy District	
Commercial Fishery	40
Escapement	40
Shellfish Fishery	
Introduction	47
Tanner Crab Fishery	
Introduction	47
History and Status	47
Tanner Crab Research Programs	48
Dungeness Crab Fishery	
Introduction	53
History and Status	53

PREFACE

This is the seventeenth Annual Management Report since the State assumed control of the fisheries in 1960. The 1976 data is preliminary and will be finalized and corrected in subsequent reports. Data presented here supersedes information presented in previous management reports.

Persons desiring additional information should direct a specific request to the area office in Cordova.

King Crab Fishery	
Introduction	59
History and Status	59
Razor Clam Fishery	63
Shrimp Fishery	67
Other Fishery	
Bottom Fish	69
Herring Sac Roe Fishery	71
Summary	72
Herring Spawn on Kelp Fishery	72
Herring Research	73
Commercial License Sales	82

PERSONNEL

The Commercial Fisheries Division employed 11 permanent employees, and 19 seasonal employees in 1976. Following is a list of personnel, general duty assignments and dates of employment.

Permanent Employees

Ralph B. Pirtle	Area Management Biologist
Peter J. Fridgen	Assistant Area Management Biologist
Michael McCurdy	Research Biologist, Project Leader
Al Kimker	Research Biologist, Project Leader
Kenneth Roberson	Research Biologist, Project Leader
Robert Zorich	Fishery Biologist 1/1 - 3/15
Frank Bird	Fishery Biologist 5/3 - 12/31
John M. Jackson	Fisheries Technician IV
Jeannette Bailey	Clerk - Stenographer
Janice Shaw	Clerk Typist
Kathy Adler	Clerk Typist

Seasonal Employees

George Addington	Coghill River Weir Station	6/1 - 8/31
Lawrence Boyle	Prince William Sound Stream Surveys	7/16 - 8/31
Anne L. Brown	* Plankton Analysis	6/16 - 6/30
		11/4 - 11/15
Dorothy Cottle	* Subsistence Fishery - Chitina	5/28 - 8/17
Karen K. Crandall	* Office and Field - Glennallen	1/1 - 9/15
Ted Fortier	* Incubation System - Subsistence	8/23 - 11/4
	Fishery Data	
Craig Gardner	* Incubation System	5/28 - 9/15
Theresa Gurske	Data Typist	1/16 - 3/31
Dena Haskell	Eshamy Weir Station	5/26 - 8/15
Russell Holder	* Incubation System	6/1 - 6/30
P. J. James	Fish Ticket Statistician	5/1 - 11/15
Al Kimker	Shellfish Biologist	1/1 - 8/15
Harley King	* Long Lake Weir	8/1 - 9/20
Craig Matkin	Eshamy Weir Station	5/26 - 8/15
Roberta McLeod	* Lake Surveys, Glennallen Office	6/1 - 8/25
Mark Miller	Coghill River Weir Station	6/1 - 8/31
Susan Mitchell	* Subsistence Fishery - Chitina	5/28 - 8/17
Lezlie Peck	* Subsistence Fishery - Chitina	5/28 - 8/17
Debra Roberts	Crab, Herrring, Clam, Salmon Sampling	2/16 - 9/15
		11/16 - 1/3/77

* Projects under the supervision of Kenneth Roberson.

LIST OF TABLES

<u>Table</u>	<u>Title</u>	<u>Page</u>
1.	Prince William Sound Area processors and buyers, 1976	3
2.	Prince William Sound case pack and pounds of frozen salmon by species, by week, 1976	3
3.	Bering River sockeye salmon weekly catch, 1976	10
4.	Bering River coho salmon weekly catch, 1976	10
5.	Copper River sockeye salmon weekly catch, 1976	13
6.	Copper River king salmon weekly catch, 1976	13
7.	Copper River coho salmon weekly catch, 1976	16
8.	Estimated sockeye salmon escapement, Copper River Delta, 1972 - 1976	19
9.	Copper River and Bering River sockeye, chinook and coho salmon escapement, 1976	20
10.	Prince William Sound subsistence fishery, 1976	22
11.	Prince William Sound pink salmon weekly catch by purse seines, 1976	24a
12.	Prince William Sound chum salmon weekly catch by purse seines, 1976	25
13.	Prince William Sound sockeye salmon weekly catch by purse seines, 1976	26
14.	Prince William Sound coho salmon weekly catch by purse seines, 1976	27
15.	Prince William Sound king salmon weekly catch by purse seines, 1976	28
16.	Prince William Sound pink, chum and sockeye salmon total estimated spawning escapement by district, 1976	29
17.	Comparison of Prince William Sound pink, chum and sockeye salmon run forecasts showing the percent of error, 1962 - 1976	30
18.	Coghill and Unakwik district purse seine and drift gill net weekly catch, 1976	35
19.	Comparative Coghill River spawning escapement estimates ..	37

LIST OF TABLES .

<u>Table</u>	<u>Title</u>	<u>Page</u>
20.	Coghill River daily weir count, 1976	38
21.	Coghill River weir station weather data, 1976	39
22.	Eshamy district salmon catch, 1950 - 1976	41
23.	Eshamy River daily weir count, 1976	43
24.	Eshamy River weir station weather data, 1976	45
25.	Prince William Sound Area historical Tanner crab catch in pounds by season	50
26.	Prince William Sound Area historical Dungeness crab catch in pounds, 1960 - 1976	56
27.	Prince William Sound Area historical king crab catch in pounds, 1960 - 1976	61
28.	Prince William Sound Area razor clam harvest in pounds, 1960 - 1976	65
29.	Prince William Sound Area shrimp harvest in pounds by gear, 1960 - 1976	68
30.	Bottom fish catch by gear, area, species and statistical area, 1976	70
31.	Herring and herring spawn on kelp in tons from Prince William Sound, 1967 - 1976	74
32.	Age, sex and size of composition of herring, Valdez Arm, 1976	77
33.	Age, sex and size of composition of herring, Green Island, 1976	78
34.	Age, sex and size of composition of herring, Gravina Bay, 1976	79
35.	Summary of commercial fishing licenses and receipts, 1976	83

LIST OF FIGURES

<u>Figure</u>	<u>Title</u>	<u>Page</u>
1.	Fishing districts	2
2.	Bering River sockeye salmon catch and escapement	11
3.	Bering River coho salmon catch, 1965 - 1976	12
4.	Copper River sockeye salmon catch and escapement, 1966 - 1976	14
5.	Copper River coho salmon catch and escapement, 1965 - 1976	17
6.	Prince William Sound pink salmon odd year catch and escape- ment	31
7.	Prince William Sound pink salmon even year catch and escapement	32
8.	Prince William Sound chum salmon catch and escapement	33
9.	Coghill district sockeye salmon catch and escapement	36
10.	Catch and escapement of sockeye salmon in the Eshamy district, 1967 - 1976	42
11.	Prince William Sound Area Tanner crab harvest areas	49
12.	Prince William Sound historical Tanner crab catch in pounds by season	51
13.	Tanner crab width frequency of historical catch, 1971 - 72 season through 1975 - 76 season, Prince William Sound	52
14.	Prince William Sound Dungeness crab harvest areas	55
15.	Orca Inlet, Prince William Sound, Dungeness crab catch, 1960 - 1976	57
16.	Copper River Flats/Controller Bay, Prince William Sound, Dungeness crab catch, 1976	58
17.	Prince William Sound king crab harvest areas	60
18.	King crab catch in pounds, Prince William Sound Area, 1960 - 1976	62
19.	Prince William Sound Area razor clam harvest areas	64
20.	Razor clam harvest in pounds, Prince William Sound Area, 1960 - 1976	66

LIST OF FIGURES

<u>Figure</u>	<u>Title</u>	<u>Page</u>
21.	Areas of herring spawning in the Northern district, Prince William Sound, 1976	75
22.	Areas of herring spawning in the Montague district, Prince William Sound, 1976	76
23.	Prince William Sound herring age class contributions from the commercial fishery, 1973 - 1976	80
24.	Annual harvest of Prince William Sound herring, 920 - 1976	81

INTRODUCTION

This is the seventeenth annual commercial fisheries management report since the State assumed control of the fisheries in 1960.

The report gives a brief description of the 1976 fishery and summarizes historical catch, escapement and related data on each species harvested by the commercial fishery. The report is compiled primarily for use as a reference source for management purposes.

The Prince William Sound Area comprises all of the drainages entering the Gulf of Alaska between Cape Suckling and Cape Fairfield. The area includes Controller Bay (Bering River), Copper River, Prince William Sound and several small rivers and streams entering the Copper River delta and the Gulf of Alaska (Figure 1).

The economy of the Prince William Sound communities depends primarily on the commercial fishery and related activities. However, the trans-Alaska oil pipeline terminus and related work provided a considerable impact to the Valdez area economy in 1976 and will continue to provide a basic income to the community for many years.

The base of the major fishery activity is Cordova, and to a lesser extent, Valdez and Whittier.

Fisheries of the area harvest five species of salmon, three species of crab, herring, herring spawn on kelp, halibut, razor clams, shrimp and miscellaneous bottom fish. Salmon is the most important fishery resource harvested, and contributes about 75 percent of the total fishery value each year.

Three types of salmon net gear are used to harvest salmon from the area. Drift gill nets are the most numerous and are used in the Bering River, Copper River, Eshamy, Coghill and Unakwik management districts. Purse seines are second in abundance and are fished in all districts of Prince William Sound except Eshamy. A small number of set gill nets are fished in the Eshamy district. Salmon troll gear was removed from the legal gear for Prince William Sound Area on March 9, 1974.

The crab species and some large shrimp are caught in pot gear. Some bottom fish and shrimp are taken with trawls. Long lines are used to catch halibut.

In 1976 four major canneries and four smaller operations processed salmon in the area. Two of the major operations custom canned or processed salmon for two other operations. Seven operators purchased salmon for processing in areas outside of the Prince William Sound Area. Three major operators processed king, Tanner and Dungeness crab. Sixteen operators processed herring, and fifteen processed herring spawn on kelp. Table 1 lists processors and buyers for the Prince William Sound Area fisheries in 1976.

A staff of six biologists, one technician and approximately twenty-five seasonal technicians conduct the research and management programs of the Prince William Sound fishery.

CORDOVA COMMERCIAL FISHERIES MANAGEMENT AREA

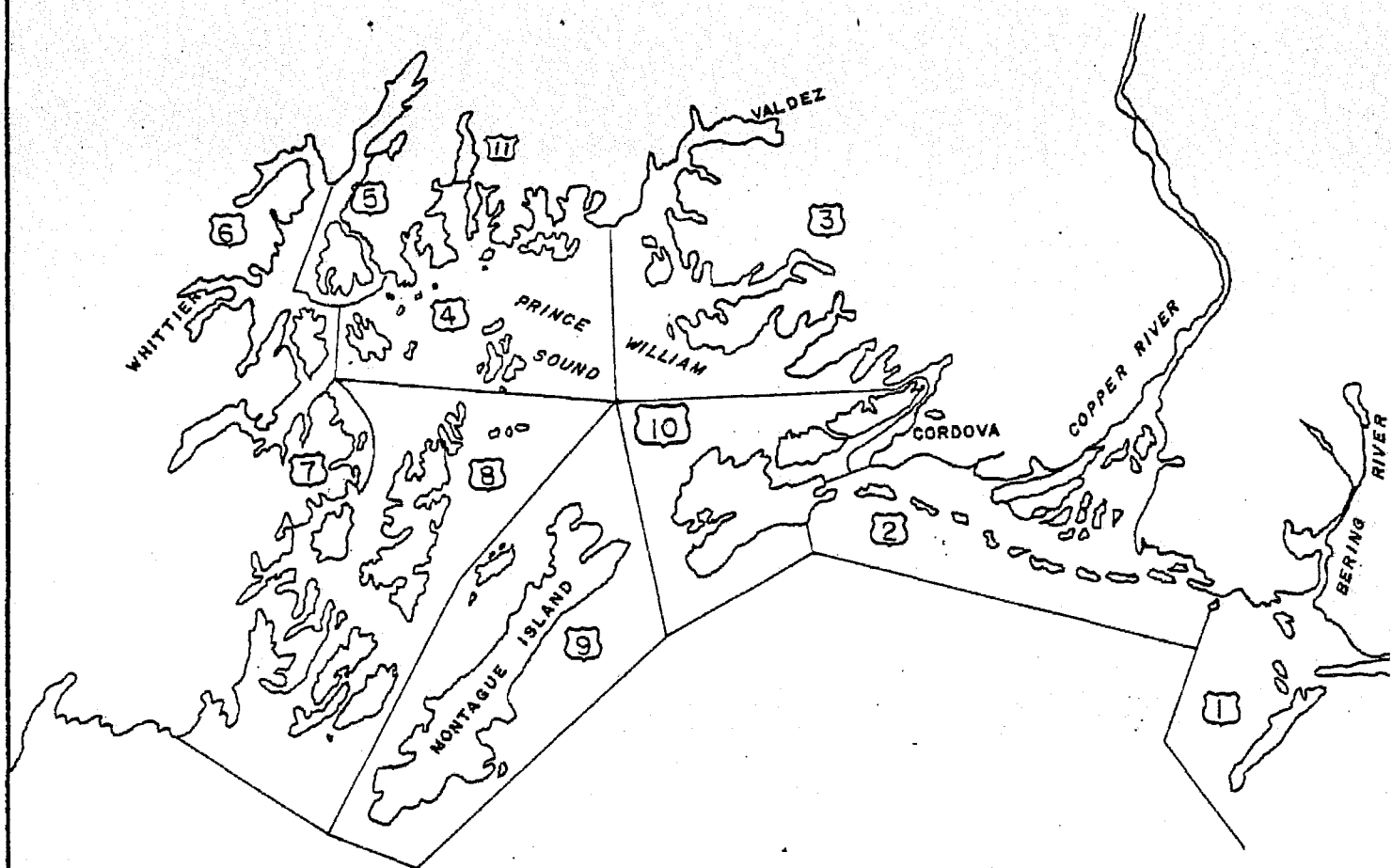


Figure 1: FISHING DISTRICTS

- | | |
|-----------------|------------------|
| 1. Bering River | 6. Northwestern |
| 2. Copper River | 7. Eshamy |
| 3. Eastern | 8. Southwestern |
| 4. Northern | 9. Montague |
| 5. Coghill | 10. Southeastern |
| | 11. Unakwik |

Table 1. Prince William Sound Area processors and buyers, 1976.

Name, Executive, Address, Location of Operation	Size of Cans Lines of Machinery	Type of Product
* A & M Associates of Canada Yasuo Muroaka, Superintendent 201 1451 East 7th Avenue Vancouver, B. C.		Herring Spawn on Kelp
* A. P. Company Arnold Phillips P. O. Box 193 Ninilchik, AK		Herring Spawn on Kelp
Alaska Packers Association 1/ Merle Wickett, Superintendent P. O. Box 380 Cordova, AK P. O. Box 3326 Bellevue, WA 98009		Salmon
Bayside Cold Storage, Inc. 2/ Fred Pettingill, Superintendent P. O. Box 636 Cordova, AK		Salmon, Herring Sac Roe, Halibut
Bergit Fish Company Stanley Samuelson, Owner P. O. Box 936 Cordova, AK		Herring Spawn on Kelp
Blake's Canning Margaret Blake, Superintendent P. O. Box 94 Cordova, AK	6 1/2 oz. Hand Pack	Salmon
* Chatham Fisheries Kake, AK		Herring Sac Roe
Columbia Ward Fisheries P. O. Box 5030 Seattle, WA 98105		Herring Sac Roe
Dragnet Fisheries Marvin Dragseth, Superintendent Kenai, AK		Herring Sac Roe
Engstrom Brothers P. O. Box 723 Juneau, AK		Salmon

Table 1, cont. Prince William Sound Area processors and buyers, 1976.

Name, Executive, Address, Location of Operation	Size of Cans Lines of Machinery	Type of Product
Fairmount Island Seafoods L. D. Wooldridge, Owner 1020 M. Street Anchorage, AK		Herring Spawn on Kelp
Harold W. Ganong S.R. C Box 254 Palmer, AK		Halibut, Red Snapper
Glacier Packing Company Percy Conrad, Owner P. O. Box 176 Cordova, AK	6 1/2 oz. smoked 7 1/2 oz. plain	Salmon
Honkola Fisheries 2/ Swen Honkola, Owner P. O. Box 1130 Cordova, AK		Salmon
Johnson Fish Company Eric Johnson, Owner P. O. Box 460 Cordova, AK		Bottomfish
Archie Jorgensen P. O. Box 1213 Cordova, AK		Dungeness Crab
* K N K Company Shawn McEvoy, Owner P. O. Box 1223 Cordova, AK		Herring Spawn on Kelp
Kenai Packers 1455 N. Northlake Place Seattle, WA 98103		Herring Sac Roe
Kodiak King Crab Howard Anderson, Superintendent P. O. Box 1457 Kodiak, AK		Herring Sac Roe
Kodiak Seafoods Bud Engstrom, Owner P. O. Box 2292 Kodiak, AK		Herring Sac Roe

Table 1, cont. Prince William Sound Area processors and buyers, 1976.

Name, Executive, Address, Location of Operation	Size of Cans Lines of Machinery	Type of Product
MSP Company C. Ross Mullins, President P. O. Box 1249 Cordova, AK		Herring Spawn on Kelp
Eugene McLeod P. O. Box 656 Whittier, AK		Shrimp
Mokuhana Fisheries, Inc. 2360 W. Commodore Way P. O. Box 99008 Seattle, WA 98199		Herring Spawn on Kelp
Morpac, Inc. ^{3/} Jack Miller, Manager P. O. Box 683 Cordova, AK	1 Line - 7 3/4 oz. 1 Line - 15 1/2 oz.	Herring Sac Roe, Herring Spawn on Kelp, Salmon, Salmon Roe, Dungeness & Tanner Crab, Razor Clams (bait)
New England Fish Company ^{4/} Jim Forsell, Superintendent P. O. Box 120 Cordova, AK	1 Line - 4 Oz. 2 Lines - 3 oz. 2 Lines - 1 lb.	Salmon, Herring Spawn on Kelp
Richard Newby 2510 Aspen Drive Anchorage, AK 99503		Herring Spawn on Kelp
North Coast Seafood Processors James Nagai, Manager P. O. Box 1262 Cordova, AK		Herring Sac Roe, Herring Spawn on Kelp
North Pacific Processors, Inc. Ken Roemhildt, Superintendent P. O. Box 1040 Cordova, AK	1 Line - 4 oz. 1 Line - 8 oz. 1 Line - 1 lb.	Salmon, Salmon Roe, Tanner and King Crab, Bottomfish (bait)
Nuka Point Fisheries Emil Nelson P. O. Box 1113 Homer, AK		Herring Sac Roe
Odiak Smokeries Jean Dettinger, Superintendent P. O. Box 153 Cordova, AK	1 Line 1/4 # hand pack 1/2 # hand pack	Salmon (smoked)
Pelican Cold Storage Bruce I. Mietchell, Superintendent P. O. Box 601 Pelican, AK		Salmon

Table 1, cont. Prince William Sound Area processors and buyers, 1976.

Name, Executive, Address, Location of Operation	Size of Cans, Lines of Machinery	Type of Product
* S. C. Seafoods, Inc. Hubert Campbell P. O. Box 926 Cordova, AK		Herring Sac Roe, Salmon
Salamatof Seafoods, Inc. Tom Waterer P. O. Box 1045 Kenai, AK		Herring Sac Roe
St. Elias Ocean Products ^{5/} Jim Poor, Superintendent P. O. Box 548 Cordova, AK	1 Line - 4 Oz. 1 Line - 3 oz. 1 Line - 4 lb.	Salmon, Salmon Roe, King, Tanner and Dungeness Crab, Halibut, Bottom Fish
Seward Fisheries, Inc. ^{6/} P. O. Box 516 Seward		Herring Sac Roe, Herring Spawn on Kelp, Salmon
Seward Marine Services Raymond C. Anderson, Supt. P. O. Box 335 Seward, AK		Herring Sac Roe
* Robert Sherman P. O. Box 2335 Cordova, AK		Salmon
Denton Sherry 17221 Palatine Ave. North Seattle, WA 98133		Salmon
Connie Taylor P. O. Box 969 Cordova, AK		Shrimp, Bottom Fish (bait)
* Gary Taylor P. O. 314 Cordova, AK		Herring Spawn on Kelp
Thorne - Smith Company Ina Thorne, Manager P. O. Box 842 Cordova, AK		Herring Sac Roe
Washington King Clam, Inc. Daniel York, Supervisor 2304 Jefferson Avenue South Tacoma, WA		Herring Spawn on Kelp

Table 1, cont. Prince William Sound Area processors and buyers, 1976

Name, Executive, Address, Location of Operation	Size of Cans Lines of Machinery	Type of Product
Whitney-Fidalgo Seafoods <u>7/</u> Robert Summers, Superintendent P. O. Box 670 Cordova, AK	.	Herring Sac Roe, Herring Spawn on Kelp, Salmon, Salmon Roe, Halibut, Bottom Fish

- 1/ New England Fish Company, Seward Fisheries and St. Elias Ocean Products custom packed for Alaska Packers Association.
 - 2/ Bayside Cold Storage and Honkola Fisheries had joint production.
 - 3/ Morpac, Inc. froze halibut for St. Elias Ocean Products.
 - 4/ New England Fish Company did some custom packing for Alaska Packers Association, St. Elias Ocean Products, Morpac, Inc. and Seward Fisheries.
 - 5/ St. Elias Ocean Products did some custom packing for Morpac, Inc., Alaska Packers Association and New England Fish Company.
 - 6/ Seward Fisheries did some custom packing for Alaska Packers Association and New England Fish Company.
 - 7/ Whitney-Fidalgo Seafoods production was processed in Whittier, Anchorage and Port Graham. Some custom packing was done for St. Elias Ocean Products.
- * No Commercial Operators Annual Report received.

Table 2. Prince William Sound Area case pack and pounds of frozen salmon, by species, by week, 1976. 1/

Week	<u>Kings</u>		<u>Sockeye</u>		<u>Cohos</u>		<u>Pinks</u>		<u>Chums</u>	
	Pounds Frozen	Cases	Pounds Frozen	Cases	Pounds Frozen	Cases	Pounds Frozen	Cases	Pounds Frozen	Cases
21	49117	8	213649	15611						
22	177451	36	194664	25220						
23	162884	71	87915	11902						
24	208493	28	137995	11057						
25	103216	7	181751	7049						13
26	45698	0	68804	5580		9		225	8627	2537
27	5826	1	141613	4537		5		434	5609	2125
28	606	0	150733	6480		16	2948	3250	34138	2611
29	3973	0	37027	2539		560	90538	22830	152080	6618
30	782	0	62749	5553	6344	701	137759	26143	107737	5447
31	325	0	13266	3419	2606	610	111437	44522	133336	4623
32	0	0	3581	368	5836	249	0	7134	7871	748
33	37	0	301	97	5931	496	0	4900	18874	0
34	0	0	50	0	58864	610	9262	9229	42177	1195
35	0	0	0	0	117581	535	0	783	0	398
36	0	0	0	0	294331	702	0	0	0	0
37	0	0	0	0	255749	486	0	0	0	0
38	0	0	0	24	170348	585	0	2312	4405	2302
<hr/>										
TOTAL	758172	151	1294110	99436	918509	5564	351944	121762	514854	28622

1/ From reports of processors. Frozen salmon reported in raw weight, and cases on a basis of 48 one pound cans. Includes 559,590 pounds imported from other areas. Does not include 1,591,774 pounds exported for processing in other areas.

BERING RIVER DISTRICT

INTRODUCTION

The Bering River district is located between Cape Martin and Cape Suckling. Salmon harvested in this area normally spawn in streams and rivers emptying into Controller Bay. The Bering River, - Bering Lake system is the main salmon producing area of the district. Sockeye and coho are the primary species harvested.

SOCKEYE SALMON

The drift gill net season in this district commenced on June 14 at 6:00 a.m. with 58 boats participating.

During the four weeks that the district was fished 30,897 sockeye salmon were harvested which is about average for this fishery. The season preliminary total was 30,908, Table 3.

COHO SALMON

Although this fishery opening coincided with the opening of the Copper River district, the district was not fished until August 23.

When the season closed on September 15 a catch of 42,423 cohos had been taken, Table 4. This catch was about average for that time period.

ESCAPEMENTS

Sockeye salmon spawning escapements in this district, like escapements into the Copper River delta streams, were above average with Bering Lake, Dick Creek and Shepard Creek, the major spawning systems, receiving excellent escapements.

Coho salmon spawning escapements were assumed to be good due to the early closure of the fishery, but adverse weather prevented all aerial survey attempts.

Figure 2 shows sockeye catch and escapement from 1966 to 1976.

Figure 3 shows coho salmon catch from 1965 to 1976.

Table 3. Bering River sockeye salmon weekly catch, 1976. 1/

Week No.	Total Catch	Number Boats <u>2/</u>	Average No. Fish/Boat
24	3,832	58	66
25	19,660	52	378
26	5,499	18	305
27	1,908	4	477
<hr/>			
Total	30,908*		

Table 4. Bering River coho salmon weekly catch, 1976. 1/

Week No.	Total Catch	Number Boats <u>2/</u>	Average No. Fish/Boat
35	7,713	36	214
36	17,859	60	298
37	13,428	67	200
38	3,423	47	73
<hr/>			
Total	42,423		

1/ Preliminary.2/ 150 fathoms drift gill net per boat.

* Includes some fish caught after Week 27.

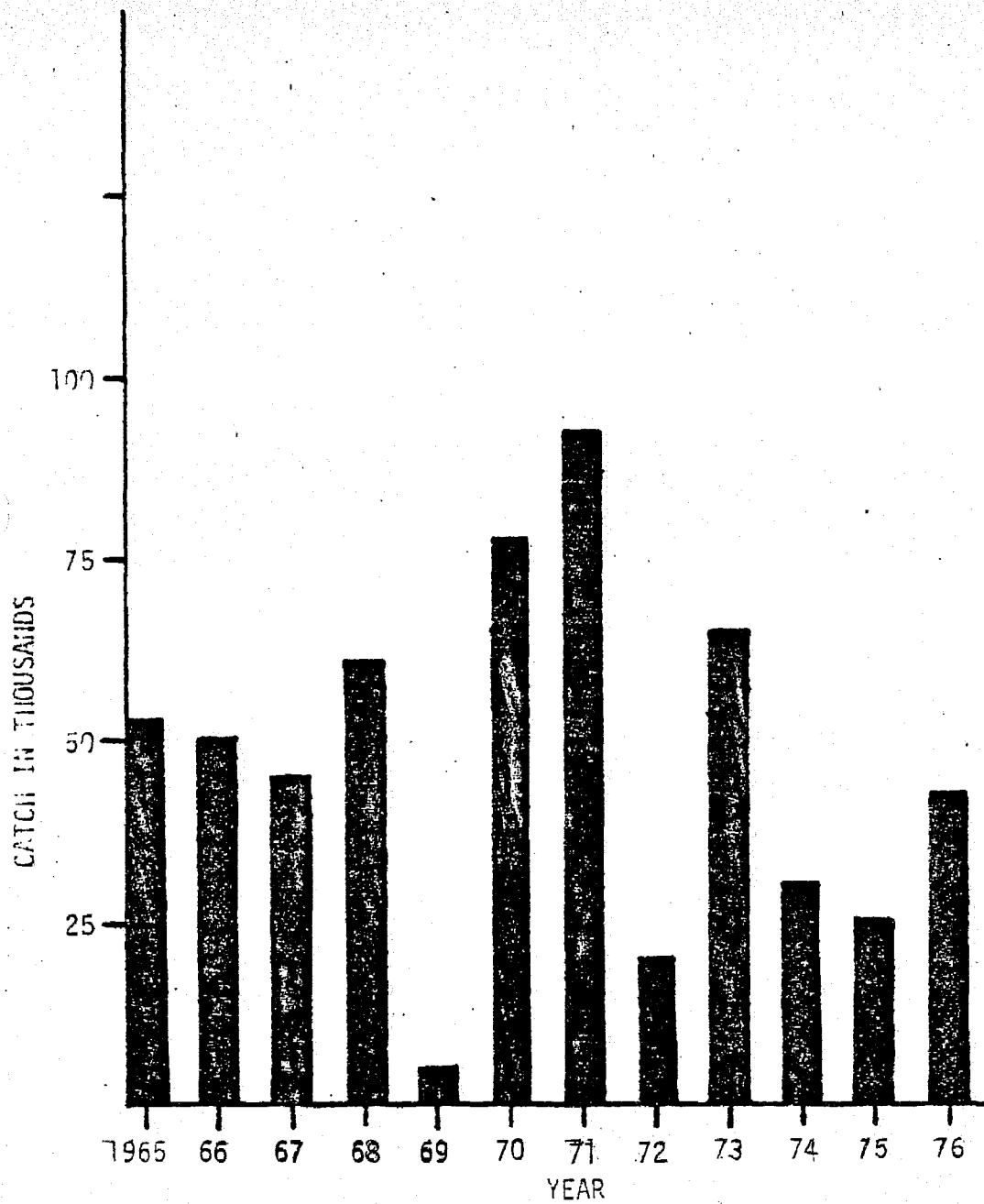


Figure 3. Bering River coho salmon catch 1965 - 1976..

COPPER RIVER DISTRICT

INTRODUCTION

The Copper River district includes all water of Hinchinbrook Island between Hook Point and Boswell Rock including Boswell Bay water south of a line from Boswell Rock to the radio tower at Whitshed Village, and water between Whitshed Village and Point Martin.

The commercial salmon fishery opens on May 15, and is one of the earliest opening salmon net fisheries in the State. Sockeye salmon and coho salmon are the primary species harvested in this fishery although king, chum and pink salmon are taken incidentally.

The sockeye salmon season is regulated by a weekly series of equal fishing and non-fishing periods. The weekly fishing period opens at 6:00 a.m. Monday and closes at 6:00 a.m. Wednesday, and is reopened at 6:00 p.m. Thursday and closes again at 6:00 a.m. Saturday. After August 7 fishing is permitted from 6:00 a.m. Monday until 6:00 p.m. Thursday. After August 31, fishing is permitted from 7:00 a.m. Monday until 7:00 p.m. Thursday. In all, a total of three and one-half days a week are fished. A total of 150 fathoms of drift gill net is allowed to be fished by each boat.

SOCKEYE SALMON

Unlike many of the past years of this fishery, fishermen-processor fish price settlements had been negotiated prior to the season opening which began on May 17.

The entire season was characterized by unusually good weather and high prices paid for fish which resulted in very little time lost.

During the opening week of the season 329 boats harvested 158,502 sockeye salmon. Fishing effort increased to 373 boats the following week when 281,761 sockeye were taken. Peak effort occurred during the period May 30 to June 5 when 404 boats participated in the fishery. Effort after that date decreased until the opening of the coho season in August.

The season total catch of 865,195 sockeye salmon, Table 5, was the largest since 1970, and was approximately 200,000 above the 15 year average.

Figure 4 presents catch and escapement for this fishery for the past 10 years.

Unlike many areas of the State where fishing time adjustments can be made to allow for additional escapement during the season, upper Copper River sockeye salmon escapement trends are unknown until catch trends are received from the upriver subsistence fishery. This time lag may be 30 or more days after the fish have passed through the commercial fishery. Because of this time lag, the in-season management of the fishery is based on weekly catch per unit of effort data. Basically what is done is this: commercial catch and effort by week for the years 1966 - 1975 is combined and cumulative percentage of catch factors and effort calculated. A prediction, based on these percentages, is made which estimates catch by week, and season total catch. Any drastic decrease below

Table 5. Copper River sockeye salmon weekly catch, 1976. 1/

Week No.	Total Catch	Number Boats <u>2/</u>	Average No. Fish/Boat
21	158,502	329	482
22	281,761	373	755
23	81,417	404	202
24	96,122	392	245
25	74,177	263	282
26	48,323	176	275
27	41,366	121	342
28	36,831	112	329
29	18,394	59	312
30	16,665	51	327
31	5,865	38	154
32	4,015	44	91
33	1,061	45	24
34	575	81	7
<hr/>			
Total	865,195		

Table 6. Copper River King salmon weekly catch, 1976. 1/

Week No.	Total Catch	Number Boats <u>2/</u>	Average No. Fish/Boat
21	2,860	329	9
22	10,250	373	28
23	10,501	404	26
24	4,882	392	13
25	2,134	263	8
26	579	176	3
27	166	121	1
28	55	112	*
29	23	59	*
30	4	51	*
31	6	38	*
32	2	44	*
33	10	45	*
<hr/>			
Total	31,472		

1/ Preliminary.2/ 150 fathoms of drift gill net gear per boat.

* Less than one.

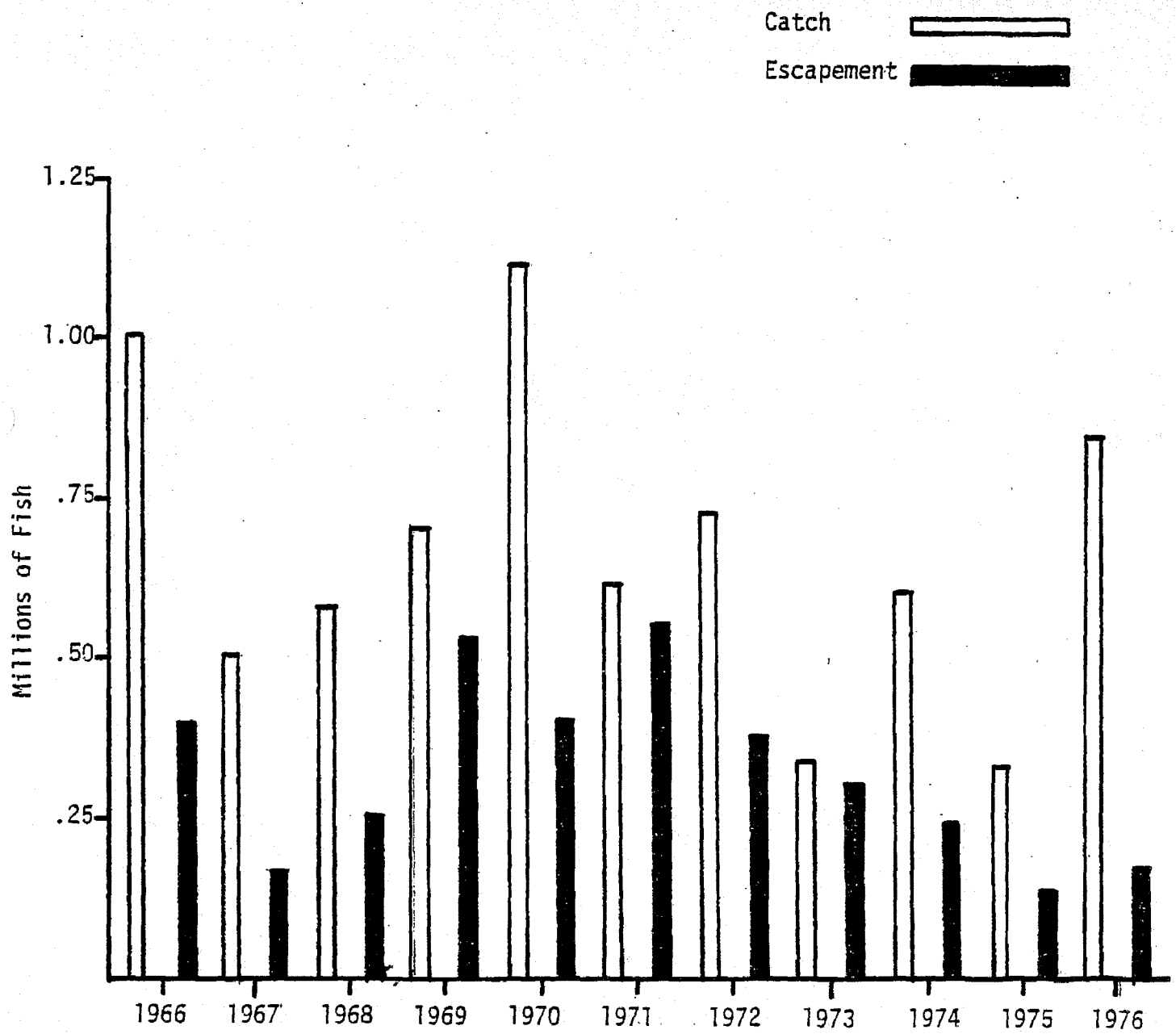


Figure 4. Copper River sockeye salmon catch and escapement, 1966 - 1976.

the weekly predicted catch can be responded to by adjusting the fishing periods. The one drawback of this method is the time lapse between the period closure and receipt and tabulation of fish tickets for the past period, which, at a minimum, is four days. The lapse of time allows commercial fishing to be pursued for two full days before the catch information can be calculated and a decision made to either decrease, prohibit, or continue fishing.

During the 1976 season a catch curve was constructed and a catch to Week 29, July 11 - July 17, of 780,000 to 790,000 calculated. Each weekly catch was above the predicted level, and at the end of Week 29, July 17, an actual catch of 836,913 sockeye had been recorded.

KING SALMON

The king salmon fishery is an incidental catch fishery with the majority of the harvest taken with standard 5 3/8 inch sockeye salmon gear.

Normally, prices paid for king salmon are less than what is paid for sockeye salmon. Much of the king catch is used by the fishermen for "home pack" and some are given away to friends. In 1976 king salmon brought higher prices than sockeye salmon resulting in the sale of almost all kings caught. The total catch of 31,472, Table 6, was the highest catch of kings recorded since 1931.

COHO SALMON

The coho season opened on August 9 and continued uninterrupted until September 15 when it was closed by emergency order. Unlike the weather during the sockeye season, this fishery was pursued during a continuous stormy period. Each weekly catch, when compared to past records, was below average, and when the emergency announcement closing the season was made, a total of 111,900 cohos had been landed, Table 7.

Figure 5 presents the Copper River coho salmon catch from 1965 to 1976.

ESCAPEMENTS

Escapement estimates are derived primarily from aerial estimates and ground counts.

The sockeye salmon escapements into spawning systems of the upper Copper River were somewhat erratic in 1976. The 1971 parent year escapements were above average which did produce a better than average commercial catch, but 1976 escapements of runs of similar timing were inconsistent. For example, spawning escapements into Fish Lake was considered to be average, but other areas of the Gulkana River system were considered poor. The Klutina River system which had a parent year escapement of over 30,000 sockeye had an escapement in 1976 of less than 5,000. The escapement into Long Lake was estimated at 2,000 sockeye in 1971, but the 1976 weir count was 24,689.

The failure of some systems and the success of others is thought to be the result of the severe winter of 1971 - 72 and the late breakup that occurred during that spring. The basis for this argument being the success of several unique spawning systems such as Fish Lake which has numerous upwelling springs throughout the lake's bottom which assures good egg to fry survival; or Long Lake, a late run system, where spawning occurs throughout the winter months and in which the eggs would not be subjected to long, adverse, winter weather periods as is the case in earlier run systems.

Table 7. Copper River coho salmon weekly catch, 1976. 1/

Week No.	Total Catch	Number Boats <u>2/</u>	Average No. Fish/Boat
28	2	112	*
29	3	59	*
30	99	51	2
31	414	38	11
32	2,614	44	59
33	7,338	45	163
34	9,119	81	113
35	32,164	168	192
36	36,202	210	172
37	20,017	175	114
38	3,928	72	55
<hr/>			
Total	111,900		

1/ Preliminary.

2/ 150 fathoms of drift gill net gear per boat.

* Less than one fish.

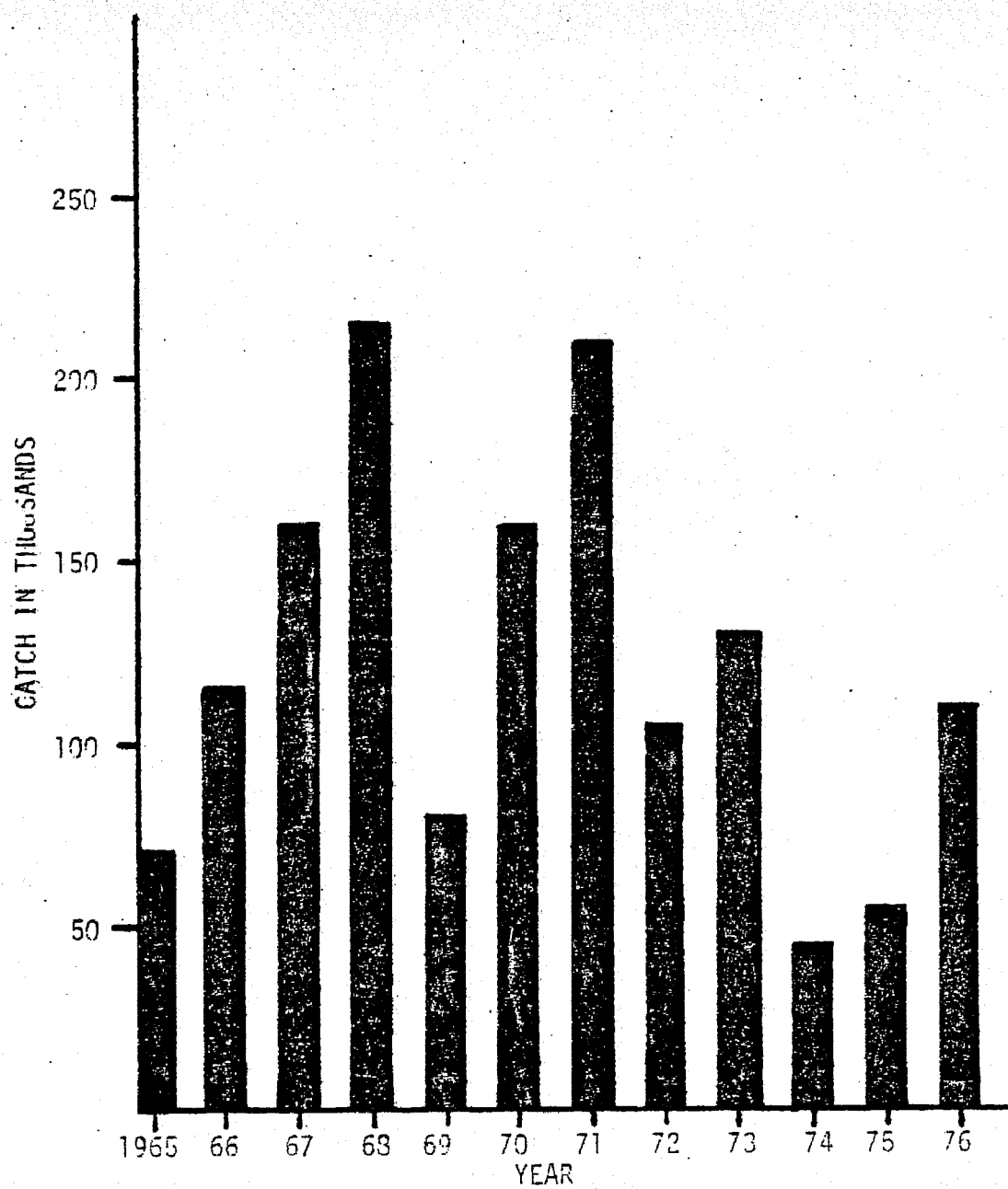


Figure 5. Copper River coho salmon catch, 1965 - 1976.

One other argument that favors the poor egg to fry survival theory is the escapement success of runs returning to spawning systems of the Copper River delta. In this area the winter of 1971 - 72 was not as severe as in upriver areas. The 1976 escapements were extremely good even though the commercial fishing effort was as intense on these fish stocks as it was on the upriver stocks, which would substantiate the poor survival assumption.

Table 8 gives estimated sockeye salmon spawning escapements for the Copper River delta for 1972 to 1976. Copper River and Bering River sockeye, chinook and coho salmon escapements for 1976 are found in Table 9.

SUBSISTENCE FISHERY

A limited salmon subsistence fishery with dip nets and fishwheels is allowed on the upper Copper River, and in the Prince William Sound Area using drift gill nets and purse seines. In 1976 the upper river catch totaled 20,931 sockeye, 2,058 kings and 24 cohos. The catch on the Copper River flats was 10 sockeye, one king and 10 cohos. The subsistence fishery catch data for 1976 is shown in Table 10.

Table 8. Estimated sockeye salmon spawning escapements, Copper River delta, 1972 to 1976.

System	Estimated Escapement				
	1972	1973	1974	1975	1976
Eyak Lake	12,275	6,000	4,625	17,500	9,000 ^{1/}
Hatchery Creek	403	687	322	700	450
McKinley Lake	600	1,800	2,000	8,000	6,000
Salmon Creek	7,204	2,000	819	2,600	4,000
26.6 & 27 Mile Creeks	1,500	1,200	250	1,200	2,500
39 Mile Creek	14,910	5,511	2,400	2,500	3,500
Goat Mountain Creek	5,500	2,100	150	400	1,500
Pleasant Creek		132	0	25	*
Tokun Lake	1,850	8,000	1,468	1,200	11,200 ^{2/}
Martin Lake	6,500	2,000	1,500	460	4,000
Little Martin Lake	3,000	1,500	1,500	2,000	9,500 ^{2/}
Pothole Lake	1,500	0	6	3,000	3,000
Ragged Point Lake	5,000	2,500	2,000	2,500	4,000
Martin River Sloughs	5,000	1,990	5,000	400	2,500
Martin Creeks	13,000	5,000	1,500	150	2,500
Total	79,742	40,420	23,540	42,635	63,450

^{1/} Includes Power Creek delta.

^{2/} Includes outlet below lake.

* Murky water - no count.

Table 9. Copper River and Bering River sockeye, chinook and coho salmon escapement, 1976. 1/

Location	Date <u>2/</u>	Method	Sockeye	Chinook	Coho
Eyak River					
Hatchery Creek	7/20	A	450	0	0
Eyak Lake	8/30	A	8,500	0	3,000
Ibek Creek	8/30	A	25	0	0
Scott Lake	8/30	A	0	0	0
Bear Lake	8/30	A	0	0	0
Power Creek	8/30	A	500	0	0
Alaganik Slough					
McKinley Lake	8/ 4	A	6,000	0	0
Salmon Creek	8/ 4	A	4,000	0	0
Pete Dahl Slough					
Mile 26 & 27 Creeks	7/14	A	2,500	0	0
Copper River Delta					
Mile 39 Creek *	8/ 4	A	3,500	0	0
Goat Mountain Creek	8/ 4	A	1,500	0	0
Pleasant Creek *	8/ 4	A	0	0	0
Martin River	7/30	A	1,500	0	0
Tokun Lake	7/ 7	A	8,500	0	0
Tokun River	8/ 4	A	2,500	0	0
Martin Lake Outlet	7/30	A	2,500	0	0
Martin Lake	8/ 4	A	4,000	0	0
Martin Feeders	7/20	A	3,000	0	0
Little Martin Lake	8/ 4	A	8,000	0	0
Pothole Lake	7/30	A	3,000	0	0
Ragged Point Lake	8/30	A	4,000	0	0
Ragged Point Outlet	8/30	A	0	0	0
Martin River Slough	7/20	A	2,500	0	1,500
Bering River					
Bering Lake	7/30	A	12,000	0	0
Dick Creek	8/30	A	8,000	0	0
Charlotte Lake **		A	0	0	0
Shepard Creek	8/ 4	A	5,500	0	0
Carbon Creek **		A	0	0	0
Maxwell Creek *		A	0	0	0
Kushtaka Lake **	8/ 4	A	2,500	0	0
Clear Creek *		A	0	0	0
Trout Creek *		A	0	0	0
Katalla River	8/30	A	0	0	200
Stillwater Creek **		A	0	0	0
Bremner River					
Peninsula Lake	8/ 6	A	0	0	0
Salmon Creek	8/ 6	A	300	0	0
Steamboat Lake	8/ 6	A	0	0	0
Tiekel River Lake	8/ 6	A	0	0	0
Tonsina River **					
Little Tonsina River	10/ 1	G	0	98	217
Tonsina Lake **	10/1 & 8/6	A	900	17	0
Bernard Creek	8/ 6	A	0	8	0

Table 9. cont. Copper River and Bering River sockeye, chinook and coho salmon escapement, 1976. 1/

Location	Date 2/	Method	Sockeye	Chinook	Coho
Klutina River	8/ 6	A	0	8	0
Manker Creek	8/ 6	A	0	6	0
Kaina Creek	8/ 9	A	0	37	0
Mahlo Creek	8/ 6	A	600	0	0
Hallet Slough	10/ 1	A	1	0	0
St. Anne Creek	8/ 6	A	1,700	0	0
Klutina Outlet **	10/ 1	A	800	0	0
Tazlina River**					
Mendeltna Creek	7/13	A	0	35	0
Gulkana River					
West Fork	7/20	A	1,308	12	0
Moose Creek	7/20	A	0	4	0
Keg Creek	7/20	A	125	0	0
Middle Fork	7/20	A	0	69	0
Dickey Lake	8/23	A	0	0	0
Swede Lake	8/23	A	10	0	0
Hungry Hollow Creek	7/20	A	0	4	0
Gulkana Mouth to West Fork	7/29	A	550	175	0
West Fork to Middle Fork	7/25	A	1,530	495	0
Middle Fork to Paxson	7/20 & 7/29	A	250	18	0
Paxson Lake Inlet	7/20	A	6,500	0	0
Paxson Lake to Mud Creek	8/10	A	4,200	0	0
Mud Creek	8/10	A	1,100	0	0
Mud Creek to Summit Lake	8/10	A	1,900	0	0
Upper Fish Lake	8/10	W	7,298	0	0
Gunn Creek	8/10	A	12	0	0
Paxson Lake Outlet	8/10	A	2,100	0	0
Chistochina River **					
East Fork	7/19	A	0	289	0
Eagle Creek	8/10	A	2	0	0
Slana River **					
Mentasta Lake	8/10	A	600	0	0
Fish Creek	8/10	A	250	0	0
Bad Crossing #1	8/10	A	0	0	0
Bad Crossing #2	7/19	A	16	0	0
Suslota Lake	7/19	A	100	0	0
Indian River	7/ 8	A	0	61	0
Ahtel Creek	7/ 8	A	0	2	0
Tanada Creek	10/ 1	A	3,900	0	0
Tanada Lake	10/ 1	A	2,200	0	0
Lakina River **					
Long Lake	10/ 1	W	24,689	0	0
Copper Lake **	10/ 1	A	4	0	0
Tana River **					
Tana River Channels **	8/ 6	A	15	0	0
Tana Lake Inlet	8/ 6	A	0	0	0
Total			157,435	1,330	4,917

1/ Escapement refers to peak survey. 2/ Date refers to peak sockeye salmon escapement. * Signifies murkey. ** Signifies glacial. A=air, W=weir, G=ground.

Table 10. Prince William Sound Area subsistence fishery, 1976.

Area	Number Permits Issued	Number Permits Returned	Type of Gear	Catch			
				Sockeye	Kings	Cohos	Other ^{2/}
Upper Copper River ^{1/}	451	363	Fishwheel	8,726	885	24	
Upper Copper River ^{1/}	2,512	2,216	Dip Net	12,205	1,173		58
Copper River Flats	27	14	Gill Net	10	1		10
Prince William Sound	0		Gill Net				
Evak, McKinley, and Hartney Bay Lakes ^{3/}	4	2	Gill Net				438
TOTAL				20,941	2,059	24	496

^{1/} Compiled from reports received through June 28, 1977.

^{2/} Includes pink salmon, whitefish, steelhead, cutthroat, Dolly Varden, lamprey, lingcod and grayling.

^{3/} Whitefish permits. Catch included 247 whitefish, 95 cutthroat, 95 Dolly Varden and 1 burbot.

PRINCE WILLIAM SOUND DISTRICTS

INTRODUCTION

The Prince William Sound Area is divided into six major districts principally for the management of a purse seine fishery for pink and chum salmon. The Sound is further divided into three smaller districts for the management of small, red salmon runs which are taken by set gill nets, drift gill nets and purse seines, Figure 1.

Fishing seasons are varied for each fishery and timed to intercept the various stocks. The Coghill - Unakwik district fishery for sockeye salmon is the earliest, beginning in late June and ending at the conclusion of the purse seine fishery. After mid-July the drift gill net fishery fishes on Coghill and Unakwik pink and chum stocks. Purse seine fishing in these districts coincides with drift gill net fishing. Fishing in the Eshamy district is conducted by both drift and set gill nets. The season for this late sockeye salmon run usually begins in early July and extends into September. Purse seines fishing in the Southwestern district in July and August catch about 30 percent of the Eshamy sockeye before they enter the gill net fishery. The purse seine fishery is conducted in all Prince William Sound districts, except Eshamy. Purse seining usually begins in early or mid-July (late July in some years), depending upon the strength of early pink salmon runs, and usually extends into the first or second week of August.

For several years the weekly fishing time had been five days per week, 6:00 a.m. Monday until 6:00 a.m. Saturday, but in 1970 the weekly fishing time was changed to 6:00 a.m. Monday until 9:00 p.m. Friday.

GENERAL DISTRICTS, PURSE SEINE FISHERY

The Prince William Sound 1976 general purse seine season was scheduled to open on July 23. Aerial surveys conducted during early July indicated stronger than anticipated early pink salmon runs, and the purse seine season was opened by emergency order two weeks earlier in the Eastern and Northern districts on July 9. All other purse seining districts were opened to fishing by emergency order on July 12. Fishing continued five days per week until closed by emergency order on July 31 when catches began to decline and spawning escapements were not being realized. Because of exceptionally strong returns of very late pink salmon to streams in the Eastern district three additional fishing days were allowed in that district on August 14, 18 and 19, (Table 11).

Early and middle runs of pink salmon produced excellent catches and escapements, and the in-season forecasts indicated the pink run would be in the forecasted range. By the end of July (Week 31) pink salmon catches had reached 2.5 million (Table 11), but both catch and escapement were beginning to lag as the late run areas failed to produce as forecast. Late runs of pinks were weaker than early and middle runs and below forecasted expectations so the general season was closed on July 31.

Monitoring of the pink runs by both aerial and ground surveys was continued which showed exceptionally strong very late returns to streams in the Eastern district. Notable of these was Duck River in Galena Bay which pro-

duced a catch of approximately 300,000, a stream escapement of 124,000 and an aquaculture donor supply of 12,000 pink salmon. The late season extension of fishing time in the Eastern district produced a catch of about 500,000, (Week 33, 34 - Table 11).

Pink salmon escapements ranged from near disaster in the Montague district to excellent in the Eastern district, Table 16.

Preliminary catch data after the season closure showed a pink salmon catch of 2,861,925. Estimated spawning escapement counts totaled 865,000 for a total pink salmon run of about 3.7 million. The forecasted return of pink salmon was 6.7 million with a range of 4.8 to 8.7 million (Table 17). Table 16 presents spawning escapement estimates of pink, chum and sockeye salmon by district for 1976 while Figures 6 and 7 show catch and escapement of odd and even year pink runs for the past 10 years. Catch by species by purse seines is presented in Tables 11, 12, 13, 14 and 15.

Chum salmon returns were forecast to be among the largest in the history of the fishery (Table 17). The forecast ranged from 1.1 to 2.5 million with a point estimate of 1.8 million. Actual catch and escapement totaled approximately 461,000 which is below the lower range of the forecast.

Similar to the pattern of 1976 returns of pinks, the early and middle run chums appeared to make up the bulk of the return while late run chum areas were very poor. The Eastern and Northern districts contributed to the major portion of the 1976 returns. Table 16 presents escapement estimates of chum salmon by district which in all cases were very poor. Figure 8 shows the chum salmon catches and spawning escapements for the past 10 year period.

Table 11. Prince William Sound pink salmon weekly catch by purse seines, 1976. 1/

Week No.	Total Catch	No. Units Gear <u>3/</u>	Average No. Fish/Boat	No. Fishing Days/Week <u>4/</u>
25 ^{2/}	20	1	20	5
26	2015	19	106	5
27	4334	34	127	5
28	135399	112	1209	5
29	495951	276	1797	5
30	660792	254	2602	5
31	1064187	275	3870	5
33	351554	171	2056	1
34	147673	140	1055	1
Total	2861925			37

1/ Preliminary data.

2/ Week 25 through 27 catches from early Coghill-Unakwik season.

3/ May include some duplicates of vessels that fished and delivered in more than one area during some weeks.

4/ Fishing 24 hours per day except Friday when fishing was allowed until 9:00 p.m. and Monday when fishing started at 6:00 a.m. Emergency order openings in portions of the Eastern district on 8/14 and 8/19 provided for 15 hour fishing days.

Table 12. Prince William Sound chum salmon weekly catch by purse seines, 1976. 1/

Week No.	Total Catch	No. Units Gear <u>3/</u>	Average No. Fish/Boat	No. Fishing Days/Week <u>4/</u>
25 ^{2/}	51	1	51	5
26	3228	19	170	5
27	2222	34	65	5
28	16444	112	147	5
29	84674	276	307	5
30	77550	254	305	5
31	46926	275	171	5
33	3473	171	20	1
34	24735	140	177	1
Total	259303			37

1/ Preliminary data.

2/ Week 25 through 27 catches from early Coghill-Unakwik season.

3/ May include some duplicates of vessels that fished and delivered in more than one area during some weeks.

4/ Fishing 24 hours per day except Friday when fishing was allowed until 9:00 p.m. and Monday when fishing started at 6:00 a.m. Emergency order openings in portions of the Eastern district on 8/14 and 8/19 provided for 15 hour fishing days.

Table 13. Prince William Sound sockeye salmon weekly catch by purse seines, 1976. 1/

Week No.	Total Catch	No. Units Gear <u>3/</u>	Average No. Fish/Boat	No. Fishing Days/Week <u>4/</u>
25 ^{2/}	18	1	18	5
26	1403	19	74	5
27	1358	34	40	5
28	2988	112	27	5
29	14860	276	54	5
30	13252	254	52	5
31	11468	275	42	5
33	52	171	*	1
34	26	140	*	1
Total	45425			37

* Less than one.

1/ Preliminary data.

2/ Week 25 through 27 catches from early Coghill-Unakwik season.

3/ May include some duplicates of vessels that fished and delivered in more than one area during some weeks.

4/ Fishing 24 hours per day except Friday when fishing was allowed until 9:00 p.m. and Monday when fishing started at 6:00 a.m. Emergency order openings in portions of the Eastern district on 8/14 and 8/19 provided for 15 hour fishing days.

Table 14. Prince William Sound coho salmon weekly catch by purse seines, 1976. 1/

Week No.	Total Catch	No. Units Gear <u>3/</u>	Average No. Fish/Boat	No. Fishing Days/Week <u>4/</u>
25 ^{2/}	0	1	*	5
26	17	19	*	5
27	1	34	*	5
28	175	112	1.6	5
29	2832	276	10.3	5
30	1275	254	5.0	5
31	951	275	3.5	5
33	35	171	*	1
34	559	140	4.0	1
Total	5845			37

* Less than one.

1/ Preliminary data.

2/ Week 25 through 27 catches from early Coghill-Unakwik season.

3/ May include some duplicates of vessels that fished and delivered in more than one area during some weeks.

4/ Fishing 24 hours per day except Friday when fishing was allowed until 9:00 p.m. and Monday when fishing started at 6:00 a.m. Emergency order openings in portions of the Eastern district on 8/14 and 8/19 provided for 15 hour fishing days.

Table 15. Prince William Sound king salmon weekly catch by purse seines, 1976. 1/

Week No.	Total Catch	No. Units Gear <u>3/</u>	Average No. Fish/Boat	No. Fishing Days/Week <u>4/</u>
25 ^{2/}	1	1	1.0	5
26	34	19	1.8	5
27	23	34	*	5
28	35	112	*	5
29	200	276	*	5
30	113	254	*	5
31 ^{5/}	87	275	*	5
Total	493			35

* Less than one.

1/ Preliminary data.

2/ Week 25 through 27 catches from early Coghill-Unakwik season.

3/ May include some duplicates of vessels that fished and delivered in more than one area during some weeks.

4/ Fishing 24 hours per day except Friday when fishing was allowed until 9:00 p.m. and Monday when fishing started at 6:00 a.m.

5/ Emergency order openings allowed in restricted areas of the Eastern district on 8/14 and 8/18, but no kings were taken.

Table 16. Prince William Sound pink, chum and sockeye salmon total estimated spawning escapement by district, 1976. 1/

<u>District</u>	<u>Number of Streams Surveyed</u>	<u>Pinks</u>	<u>Chums</u>	<u>Sockeye</u>
Eastern	49	446,470	17,870	1,000
Northern - Unakwik	20	123,380	26,520	3,600
Coghill	5	20,450	34,500	9,356 <u>2/</u>
Northwestern	25	96,280	3,960	600
Eshamy	5	5,500	0	19,367 <u>3/</u>
Southwestern	25	45,700	90	1,400
Montague	31	12,260	0	0
Southwestern	30	115,560	950	0
Total	190	865,600	83,890	35,323

1/ Number of salmon rounded to nearest 10.

2/ Coghill River weir count was 9,056.

3/ Eshamy River weir count.

Table 17. Comparison of Prince William Sound pink, chum and sockeye salmon run forecasts showing the percent of error, 1962 - 1976.

Year	Pink			Chum			Sockeye		
	Mean Forecast	1/ Return	Percent Error 2/ Forecast	Mean Forecast	1/ Return	Percent Error 2/ Forecast	Mean Forecast	1/ Return	Percent Error 2/ Forecast
1962	8.9	8.7	+ 2.25						
1963	5.0 <u>3/</u>	6.6	-32.00						
1964	6.1	6.0	+ 1.64	1.00	0.92	+ 8.00			
1965	4.2	3.4	+19.05	0.73	0.39	+46.58			
1966	6.3	4.0	+36.51	0.58	0.65	-12.07			
1967	3.3	3.8	-15.15	0.44 <u>4/</u>	0.45	- 2.27			
1968	3.1	3.5	-12.90	0.68	0.55	+19.12			
1969	5.8	5.9	- 1.72	0.44	0.48	- 9.09	0.19	0.18	+ 5.26
1970	4.4	3.8	+13.64	0.34	0.33	+ 2.94	0.09	0.04	+55.55 *
1971	6.2	9.5	-34.57	0.76	0.74	+ 2.63.			
1972	1.7	0.9	+47.06	0.80	0.47	+41.25			
1973	2.7	3.3	-17.85	0.64	1.28	-100.00			
1974	2.0	1.3	+35.00	0.29	0.28	+ 3.45			
1975	4.3	6.1	-41.86	0.22	0.15	+31.81			
1976	6.7	3.9	+41.79	1.80	0.46	+74.44			

1/ In millions of fish.

2/ (Mean Forecast minus Actual Estimated Return)
Mean Forecast

3/ Weighted fry densities to include upstream production indicated 5.8 million, or an error of -13.2 percent.

4/ Using expanded estimate of 4 year return to total.

* Estimated.

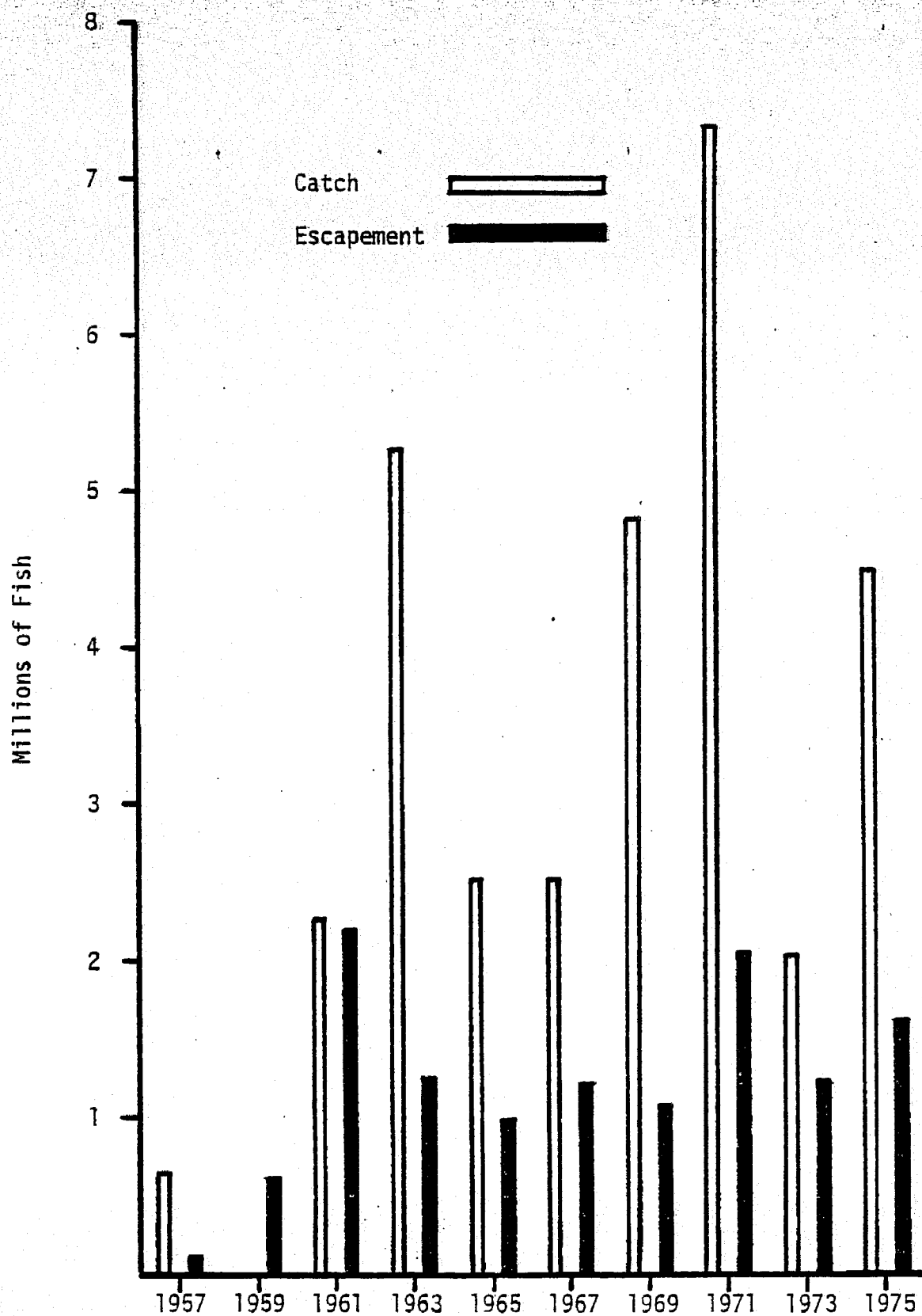


Figure 6. Prince William Sound pink salmon odd year catch and escapement.

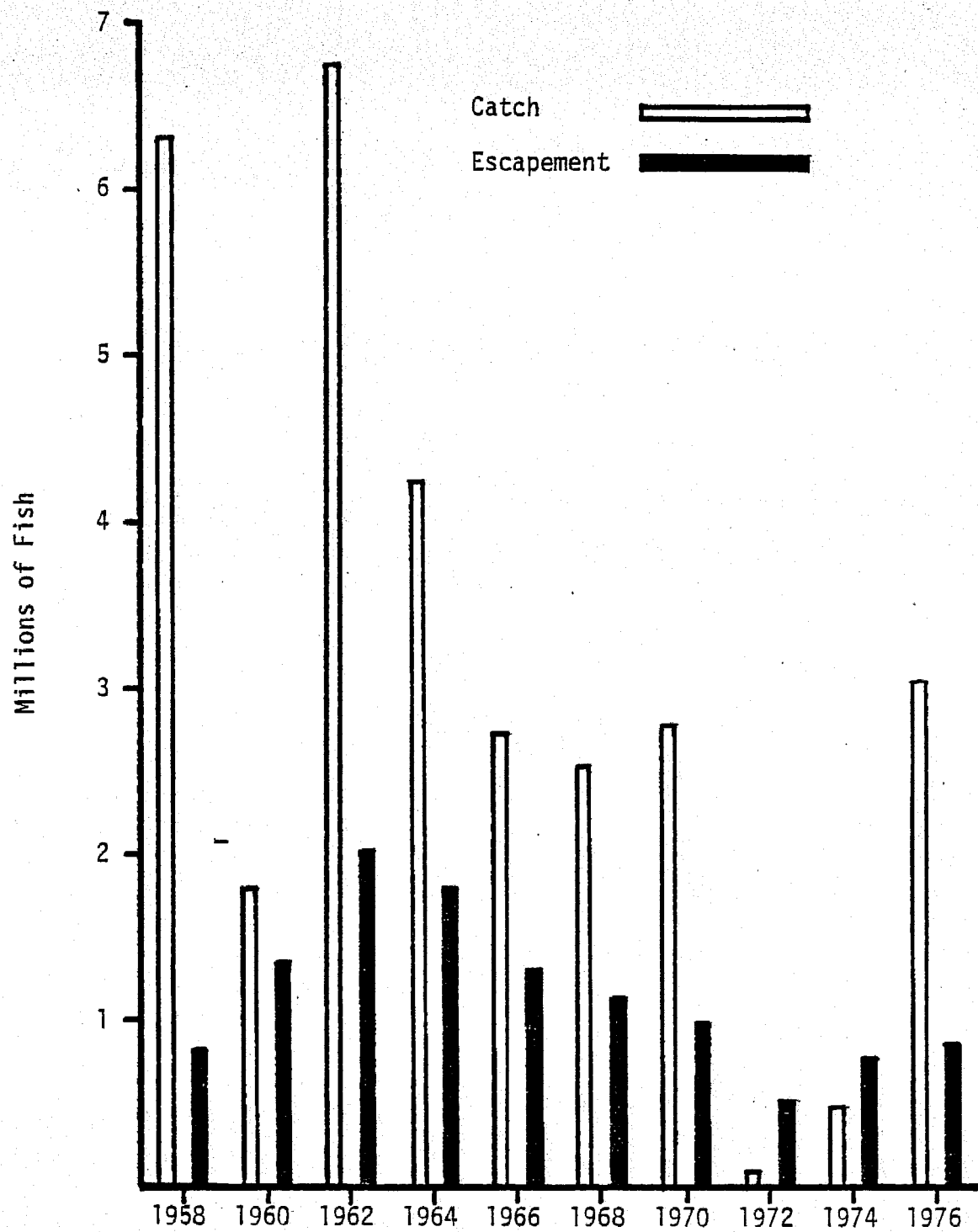


Figure 7. Prince William Sound pink salmon even year catch and escapement.

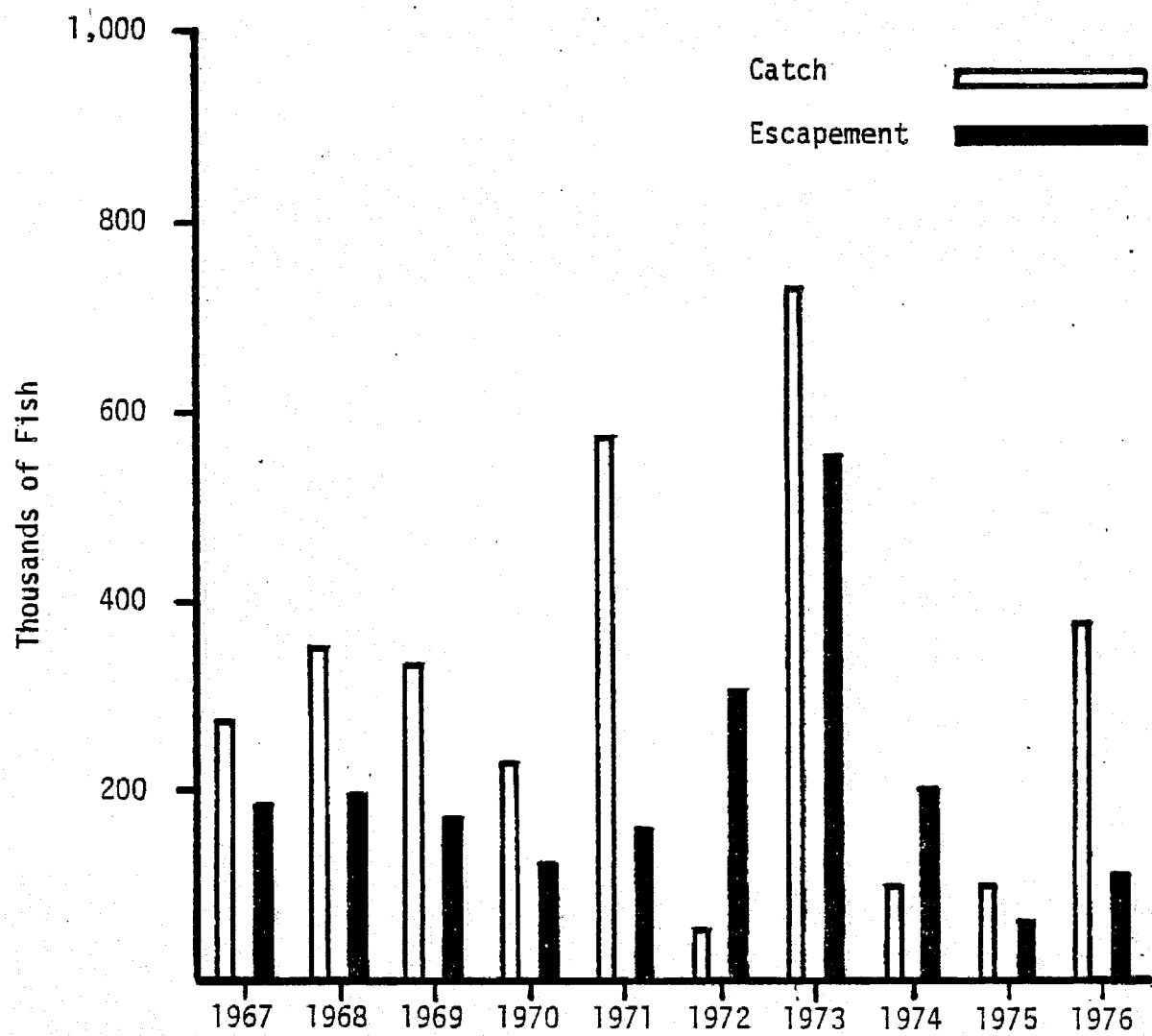


Figure 8. Prince William Sound chum salmon catch and escapement.

COGHILL AND UNAKWIK DISTRICTS

DISTRICT DESCRIPTIONS

The Coghill district includes the water within one mile on the south shore of Esther Island and all of the water of Port Wells north of a line from Esther Rock to Point Pigot. Prior to 1976 the water of the western half of Port Wells was included in the Northwestern district.

The Unakwik district includes water of Unakwik Inlet north of 61° 01' N. lat.

COMMERCIAL FISHERY

The fishery opened as scheduled on June 18 and continued five days per week until closed by emergency order at 10:00 a.m. on July 31 when catches began to decline and spawning escapement was not being realized.

This was the first year that drift gill nets were allowed to fish the west side of Port Wells, the water of which had previously been included in the Northwestern district which allowed only purse seine fishing. Also, drift gill nets were allowed for the second year to fish throughout the general purse seine season in the Coghill - Unakwik districts. Prior to 1975 the drift gill net season in these districts was closed about July 20 of each year after the sockeye run was over.

The fishery, both purse seine and drift gill net, produced fair catches of both pink and chum salmon. Preliminary season totals show a drift gill net catch of 142 king, 67,384 sockeye, 206 coho, 157,066 pink and 111,175 chum salmon. Purse seine catches totaled 88 kings, 6,945 sockeye, 33 coho, 227,091 pink and 56,185 chum salmon, Table 18. Figure 9 shows the commercial catch of sockeye salmon for the Coghill district from 1967 to 1976.

ESCAPEMENT

Weir counts of sockeye into Coghill Lake showed a below average escapement of 9,056, considerably below 1974 and 1975 with comparative weir counts. Estimated escapements and weir counts are given in Table 19 which shows the sockeye escapement in 1976 to be the lowest recorded. Aerial surveys of Coghill River and Lake produced an escapement estimate of 20,450 pinks and 34,500 chums. Annual escapement estimates and weir counts for sockeye, pink and chum salmon into the Coghill River system are presented in Table 19.

General weather data for the Coghill River weir station is given in Table 21.

Table 18. Coghill and Unakwik district purse seine and drift gill net weekly catch, 1976. 1/

<u>Week</u>	<u>Purse Seine</u>					<u>Units of Gear</u> 2/
	<u>King</u>	<u>Sockeye</u>	<u>Coho</u>	<u>Pink</u>	<u>Chum</u>	
25	1	18	0	20	51	1
26	34	1,403	17	2,015	3,228	19
27	23	1,358	1	4,334	2,222	34
28	22	1,846	5	24,431	9,260	112
29 ^{3/}	7	1,815	10	37,354	17,142	47
30		247	0	57,814	16,461	32
31	1	258	0	101,123	7,821	32
Sub-total	88	6,945	33	227,091	56,185	
	<u>Drift Gill Net</u>					
25	5	929	1	67	1,344	28
26	43	22,067	0	3,207	28,517	179
27	23	17,904	8	7,150	18,082	244
28	15	17,093	4	16,500	23,725	193
29	14	4,845	58	23,648	16,335	120
30	22	2,737	46	47,383	12,908	120
31	20	1,809	89	59,111	10,264	116
Sub-total	142	67,384	206	157,066	111,175	
TOTAL	230	74,329	239	384,157	167,360	

1/ Preliminary.

2/ Includes some suplicates of vessels that fished more than one area during some weeks.

3/ General purse seine season opened this week.

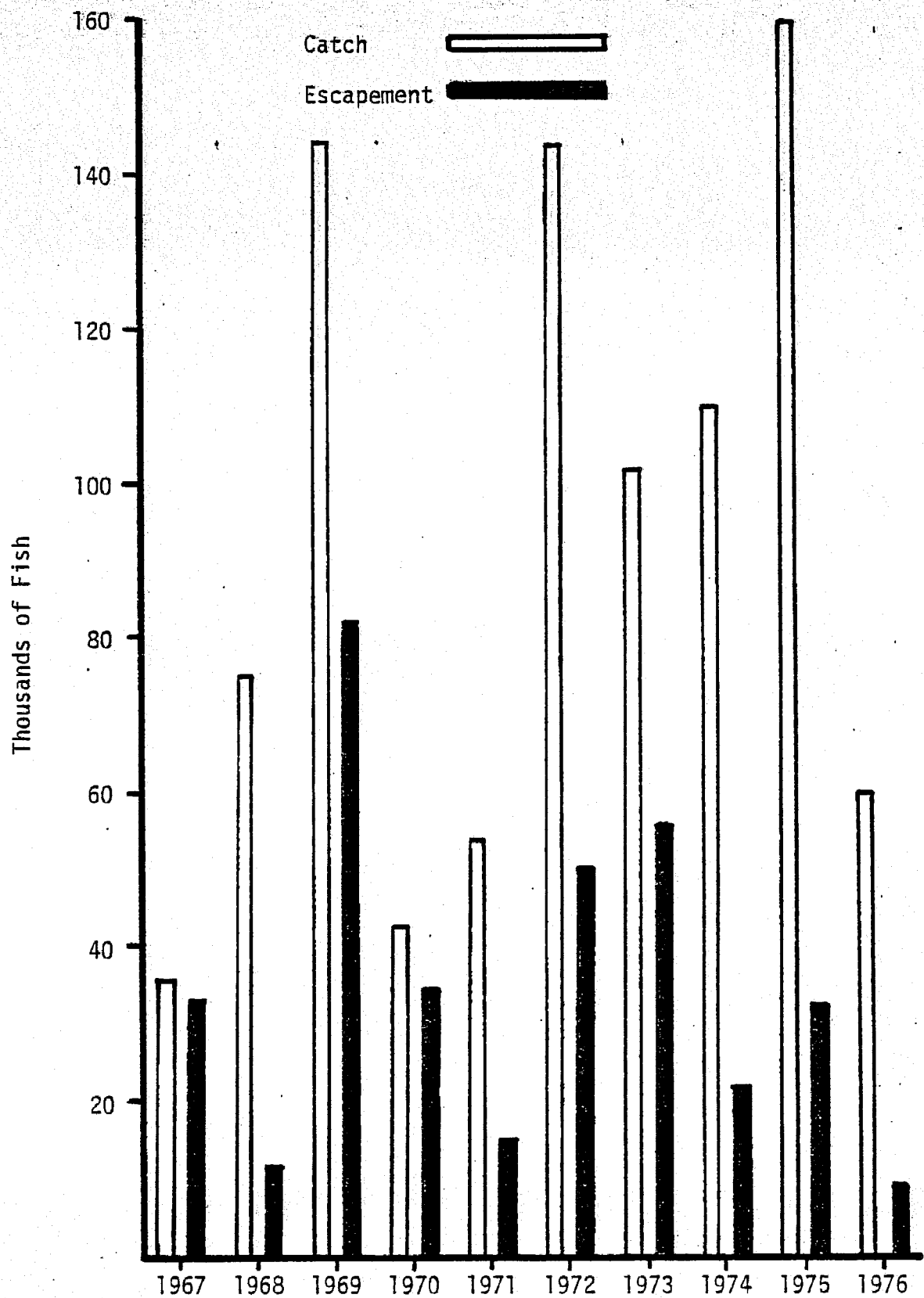


Figure 9. Coghill district sockeye salmon catch and escapement.

Table 19. Comparative Coghill River spawning escapement estimates, 1960 - 1976.

Year	WEIR - TOWER ESTIMATES ^{1/}				AERIAL - GROUND SURVEY ESTIMATES ^{2/}			
	Sockeye	Chums	Pinks	Coho	Sockeye	Chums	Pinks	Coho
1960					129,000	24,012	2,340	
1961	54,792	1,160	183,661		140,000	49,324	195,600	
1962	26,866		114		12,000	27,000	3,520	
1963	63,984				75,000	63,400	57,930	280
1964					22,200	37,640	9,720	
1965	40,000				85,000	13,200	62,000	
1966	80,000				85,000	10,360	6,260	
1967	11,800*	7,960	187,224		33,000	6,600	139,300 ^{3/}	
1968 ^{4/}					11,800	12,640	2,650	
1969 ^{5/}	10,142*				81,000	34,600	72,000	
1970 ^{5/}	9,658				35,200	3,080	18,580	
1971	no weir count				15,000	10,200	500,000	
1972	16,392				51,000	11,700	7,770	
1973	13,281				55,000	73,600	543,150	
1974 ^{6/}	22,333**				21,000	31,500	20,680	
1975	34,855	134	163,070	190	30,000	5,000	552,060	
1976	9,056	852	1,046	0	**	34,500	20,450	

^{1/} Above weir.^{2/} Entire system.^{3/} Estimated from stream counts. Aerial estimates of schooled pink salmon in Coghill Lake indicated an escapement in excess of 500,000.^{4/} Aerial estimate of sockeye salmon escapement only as sockeye migration preceeded weir installation.^{5/} The weir was removed prior to the upstream migration of pinks and chums.^{6/} Standard weir constructed in 1974 to obtain complete count of salmon.

* Unexpanded counts

** No aerial survey conducted.

Table 20. Coghill River daily weir count, 1976.

Date	Sockeye Counts		Daily Total	Cumulative Total
	Adult	Jack ^{1/}		
6/17	Weir installed and complete. Estimated 450 sockeye above weir.			
28	452	7	459	459
29	281	9	290	749
30	274	8	282	1,031
7/ 1	619	9	628	1,659
2	1,064	9	1,073	2,732
3	360	3	363	3,095
4	153	0	153	3,248
5	996	6	1,002	4,250
6	541	5	546	4,796
7	715	6	721	5,517
8	367	6	373	5,890
9	642	2	644	6,534
10	488	5	493	7,027
11	260	1	261	7,288
12	361	4	365	7,653
13	142	0	142	7,795
14	301	2	303	8,098
15	146	1	147	8,245
16	162	4	166	8,411
17	122	3	125	8,536
18	34	0	34	8,570
19	52	1	53	8,623
20	94	0	94	8,717
21	73	0	73	8,790
22	73	1	74	8,864
23	80	1	81	8,945
24	10	0	10	8,955
25	24	0	24	8,979
26	39	1	40	9,019
27	15	0	15	9,034
28	12	0	12	9,046
29	5	0	5	9,051
30	3	0	3	9,054
31	2	0	2	9,056
8/ 1	Pulled pickets from weir.			
Total	8,962	94	9,056	

^{1/} Sockeye less than 560 m.m. from tip of nose to fork of tail.

Table 21. Coghill River weir station weather data, 1976.

Date	Air Temp. <u>1/</u>	Air Temp. Max.	Air Temp. Min.	Water Temp. <u>2/</u>	General Weather Conditions <u>3/</u>	Precipitation
6/20	59	61	32	39	3 Broken Clouds	
21	53	58	40	39	4 Overcast	
22	55	58	40	39	4 Overcast	T
23	68	69	37	41	1 Clear	
24	72	74	34	40	1 Clear	
25	74	74	38	40	1 Clear	
26	75	78	34	40	1 Clear	
27	58	58	43	40	4 Overcast	T
28	68	70	44	40	1 Clear	
29	70	71	33	42	1 Clear	
30	62	67	40	42	3 Broken Clouds	
7/ 1	55	55	46	42	4 Overcast	R
2	57	59	43	43	4 Overcast	
3	58	63	44	44	3 Broken Clouds	
4	56	56	43	42	4 Overcast	R
5	57	60	43	44	3 Broken Clouds	
6	70	73	33	46	1 Clear	
7	73	74	35	46	1 Clear	
8	76	77	37	47	1 Clear	
9	75	78	38	48	2 Scattered Clouds	
10	60	60	45	48	4 Overcast	T
11	56	59	44	45	4 Overcast	T
12	60	66	46	48	4 Overcast	
13	61	64	46	47	4 Overcast	
14	64	69	34	47	1 Clear - Broken Clouds	
15	60	64	46	47	4 Overcast - Clear	T
16	56	62	36	48	4 Overcast	T
17	66	67	44	48	1 Clear	
18	65	66	40	47	2 Scattered Clouds	
19	63	65	39	48	2 Scattered Clouds	
20	65	67	37	48	2 Scattered - Overcast	
21	57	60	43	49	4 Overcast	T
22	58	58	47	49	4 Overcast	R
23	56	59	44	51	4 Overcast	R
24	66	68	37	53	2 Scattered Clouds	
25	69	69	33	51	1 Clear	
26	59	62	34	49	4 Overcast	T
27	64	66	44	52	3 Broken Clouds	T
28	60	64	45	50	4 Overcast	
29	58	60	47	49	4 Overcast	
30	69	72	41	49	1 Clear	
31	73	78	38	52	1 Clear	

1/ All temperatures in degrees Fahrenheit. Daily air temperature taken at 1700 hours.

2/ Water temperature taken at the weir at 0800 hours. 3/ Weather observations is the condition which best represents the period from 0600 hours until 2200 hours reported. Scattered Clouds = 1/3 covered; Broken Clouds = 2/3 covered; Overcast = complete cover; T = trace of rain or showers; R = rain.

ESHAMY DISTRICT

COMMERCIAL FISHERY

In expectation of a small return of sockeye salmon to Eshamy district, the season was closed to fishing in 1976.

Table 22 presents Eshamy district catch from 1950 to 1975, while Figure 10 shows the commercial catch of sockeye from 1967 to 1976.

ESCAPEMENT

The 1976 spawning escapement of sockeye salmon to Eshamy Lake and River is shown by the daily weir count in Table 23.

Counting at the weir began in 1976 on June 16, but no sockeye were counted at the weir until June 28. Counting was continued daily until September 13. The 1976 weir count of 19,367 is the highest count recorded since 1972.

General weather and Eshamy River water level data is presented in Table 24.

Table 22. Eshamy district salmon catch, 1950 - 1976.

Year	Kings	Sockeye	Pinks	Chums	Cohos	Total
1950		26,772	23,289	3,976	780	54,817
1951		78,360	62,790	9,552	1,580	152,282
1952		43,128	11,025	2,372	720	57,245
1953		15,828	52,815	9,152	1,070	78,865
1954		7,848	15,666	5,560	560	29,634
1955		12,919	26,857	4,806	595	45,177
1956		75,355	32,101	14,439	788	122,683
1957		33,665	22,672	12,183	738	69,253
1958			S E A S O N	C L O S E D		
1959			S E A S O N	C L O S E D		
1960			S E A S O N	C L O S E D		
1961		55,133	113,326	22,918	1,324	192,701
1962		23,857	76,345	39,909	3,895	144,006
1963			S E A S O N	C L O S E D		
1964			S E A S O N	C L O S E D		
1965		15,456	550	649	71	16,726
1966		20,826	36,584	7,896	745	66,051
1967			S E A S O N	C L O S E D		
1968			S E A S O N	C L O S E D		
1969	16	61,728	25,273	8,021	46	95,084
1970	2	17,292	44,381	5,632	579	67,886
1971			S E A S O N	C L O S E D		
1972	82	52,888	45,378	26,008	1,146	125,499
1973	69	16,439	21,501	27,546	149	65,704
1974	22	19,034	285,441	28,896	125	333,518
1975			S E A S O N	C L O S E D		
1976			S E A S O N	C L O S E D		
<hr/>						
TOTAL	191	576,528	895,991	230,015	14,911	1,717,636
<hr/>						
AVERAGE ^{1/}	11	33,913	52,705	13,530	877	101,037
<hr/>						

^{1/} Average of years fished.

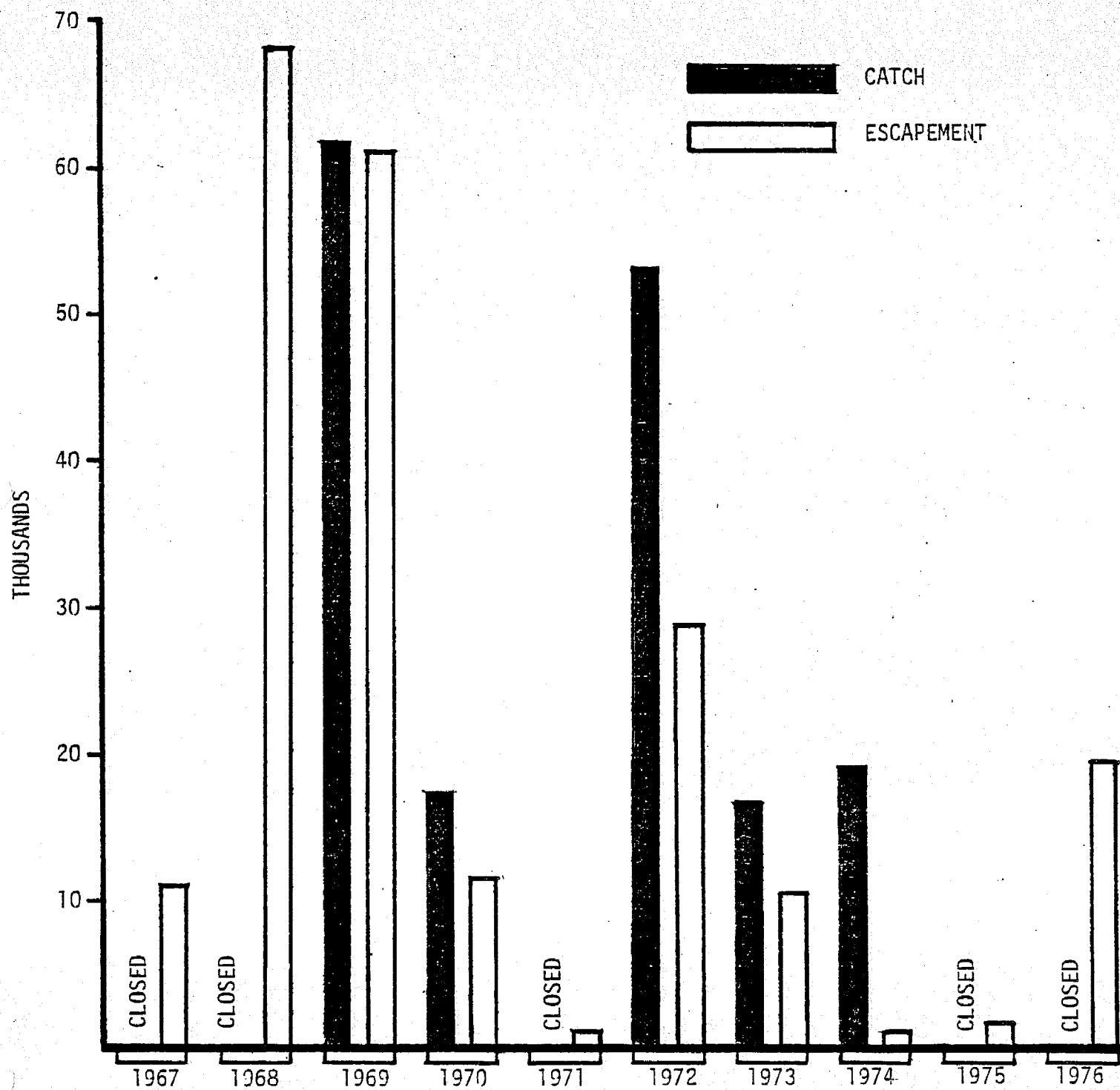


Figure 10. Catch and escapement of sockeye salmon in the Eshamy district, 1967 - 1976.

Table 23. Eshamy River daily weir count, 1976.

Date	Sockeye Salmon		Daily Total	Weekly Total	Cumulative Total
	Adult	Jack ^{1/}			
6/16	weir installed and complete				
20	salmon observed at river mouth				
27	approximately 45 sockeye observed at river mouth				
28	51	0	51		51
29	0	0	0		51
30	10	4	14		65
7/ 1	33	9	42		107
2	106	41	147		254
3	5	1	6		260
4	40	4	44	304	304
5	115	16	131		435
6	240	23	263		698
7	366	38	404		1102
8	492	46	538		1640
9	236	56	292		1932
10	0	0	0		1932
11	68	3	71	1699	2003
12	12	2	14		2017
13	1	0	1		2018
14	14	2	16		2034
15	37	5	42		2076
16	125	9	134		2210
17	35	3	38		2248
18	208	12	220	465	2468
19	38	4	42		2510
20	232	8	240		2750
21	114	5	119		2869
22	18	1	19		2888
23	28	1	29		2917
24	82	4	86		3003
25	123	4	127	662	3130
26	37	0	37		3167
27	86	5	91		3258
28	26	0	26		3284
29	16	2	18		3302
30	9	0	9		3311
31	1	0	1		3312
8/ 1	19	1	20	165	3332
2	14	0	14		3346
3	1	0	1		3347
4	0	0	0		3347
5	268	6	274		3621
6	448	15	463		4084
7	708	13	721		4805
8	204	3	207	1666	5012
9	1658	73	1731		6743
10	514	19	533		7276
11	173	7	180		7456
12	718	15	733		8189
13	37	1	38		8227
14	48	3	51		8278
15	127	8	135	3401	8413

Table 23 cont. Eshamy River daily weir count, 1976.

Date	Sockeye Salmon		Daily Total	Weekly Total	Cumulative Total
	Daily Count Adult	Jack ^{1/}			
8/16	760	19	779		9192
17	123	3	126		9318
18	1795	36	1831		11149
19	1109	42	1151		12300
20	2094	62	2156		14456
21	649	32	681		15137
22	137	7	144	6868	15281
23	55	3	58		15339
24	339	17	356		15695
25	804	28	832		16527
26	1650	60	1710		18237
27	490	36	526		18763
28	127	7	134		18897
29	161	10	171	3787	19068
30	107	4	111		19179
31	14	1	15		19194
9/ 1	35	4	39		19233
2	13	1	14		19247
3	19	3	22		19269
4	13	1	14		19283
5	13	1	14	229	19297
6	12	0	12		19309
7	14	3	17		19326
8	7	1	8		19334
9	29	1	30		19364
10	0	0	0		19364
11	1	0	1		19365
12	2	0	2	58	19367
13	pickets removed from weir. ^{3/}				
<hr/>					
Total	18,513	854			19367

^{1/} Sockeye less than 560 m.m. from tip of nose to fork of tail.^{2/} Hole found in weir.^{3/} When weir dismantled 15 sockeye were observed downstream of the weir.

Table 24. Eshamy River weir station weather data, 1976.

Date	Air Temp. ^{1/} (1900 hrs.)	Air Max.	Temp. ^{1/} Min.	Water Temp. ^{2/}	General Weather ^{3/}	Precipitation
6/ 9		59	36		4 Overcast	R
10	54	56	42		2 Scattered Clouds	T
11	55	67	38		1 Clear	
12	48	51	39		4 Overcast	T
13	44	53	41		4 Overcast	T
14	54	62	39		2 Scattered Clouds	
15	50	64	42	38	2 Scattered Clouds	
16	46	48	42		4 Overcast	R
17	46	48	41	38.5	4 Overcast	R
18	49	56	40	39	2 Scattered Clouds	
19	47	56	40	39	2 Scattered Clouds	
20	52	60	38		4 Overcast	
21	50	56	44	41.5	4 Overcast	
22	50	58	38	41	3 Broken Clouds	
23	50	65	41	42	1 Clear	
24	54	67	41		1 Clear	
25	56	66	42	43.5	1 Clear	
26	64	67	44	43.5	1 Clear	
27	57	59	51	49	4 Overcast	
28	64	66	42	50	1 Clear	
29	60	64	47	50	1 Clear	
30	57	58	53	52	4 Overcast	
7/ 1	54	57	51	52	4 Overcast	
2	53	56	51	52	4 Overcast	
3	53	55	51	52	4 Overcast	
4	52	54	50	52	4 Overcast	
5	52	56	50	54	4 Overcast	
6	58	64	48		1 Clear	
7	64	77	50	57	1 Clear	
8	62	70	51		1 Clear	
9	64	73	53	58	1 Clear	
10	58	61	56	58	4 Overcast	
11	54	58	52	58	4 Overcast	
12	58	70	51	58	2 Scattered Clouds	
13	58	60	46	58	3 Broken Clouds	
14	56	62	46	58	3 Broken Clouds	
15	55	56	52		3 Broken Clouds	
16	52	6	49	58	4 Overcast	R
17	55	55	47		4 Overcast	T
18	59	60	52	58	3 Broken Clouds	
19	56	59	53	58	4 Overcast	
20	55	58	52		4 Overcast	
21	54	59	51	58	4 Overcast	R
22	54	58	51		4 Overcast	T
23	53	57	51		4 Overcast	R
24	53	58	46		1 Clear	
25	56	72	44	58	1 Clear	
26	55	63	47		3 Broken Clouds	T
27	56	62	51		3 Broken Clouds	T

^{1/} Temperature in degrees Fahrenheit. ^{2/} Temperature in degrees Fahrenheit taken at 0900 at the weir. ^{3/} Weather observation is the condition which best represents the period from 0600 hours until 2200 hours reported. Scattered clouds = 1/3 covered; Broken Clouds = 2/3 covered; Overcast = complete cover; T = trace of rain or showers; R = rain.

Table 24 cont. Eshamy River weir station weather data, 1976.

Date	Air Temp. 1/ (1900 hrs.)	Air Max.	Temp. 1/ Min.	Water Temp. 2/	General Weather 3/	Precipitation
7/28	54	57	52	58	4 Overcast	
29	58	59	52	58	4 Overcast	
30	65	76	53		1 Clear	
31	64	76	53		1 Clear	
8/ 1	60	71	53	58	1 Clear	
2	58	65	51	59	4 Overcast-Clear	
3	57	66	51	60	2 Scattered Clouds	
4	60	67	53		2 Scattered Clouds	
5	58	59	54	60	4 Overcast	T
6	55	57	53		4 Overcast	R
7	54	56	53	60	4 Overcast	R
8	54	54	50	60	4 Overcast	R
9	54	56	52		4 Overcast	R
10	54	59	53	59	4 Overcast	
11	55	58	53	58	4 Overcast	T
12	53	58	49	57	4 Overcast-Scattered	T
13	57	64	47	58	1 Clear	
14	54	58	51	58	4 Overcast	T
15	54	58	52	58	4 Overcast	T
16	53	58	50	58	4 Overcast	
17	53	57	50		4 Overcast	T
18	50	52	49	57	4 Overcast	R
19	53	54	49	57	4 Overcast	R
20	53	56	49		2 Scattered Clouds	
21	58	65	48	56	1 Clear	
22	58	73	47	57	1 Clear	
23	56	59	47		3 Broken Clouds	
24	55	59	48	57	4 Overcast	
25	51	54	50		4 Overcast	R
26	49	52	49	57	4 Overcast	R
27	50	51	48	54	4 Overcast	R
28	51	52	48		4 Overcast	R
29	52	55	49	54	4 Overcast	T
30	50	68	43	54	1 Clear	
31	51	55	44		2 Scattered-Overcast	T
9/ 1	50	53	46	54	4 Overcast	T
2	49	51	45	54	4 Overcast	T
3	48	51	40	54	4 Overcast	T
4	48	53	44		4 Overcast-Clear	
5	46	58	39		1 Clear	
6	48	62	40		2 Scattered-Overcast	T
7	50	52	45	52	4 Overcast	R
8	46	51	46	51	4 Overcast	R
9	48	61	42	51	1 Clear	
10	48	52	41	51	4 Overcast	T
11	48	49	42	51	4 Overcast	T
12	47	47	43	52	4 Overcast	R
13	47	47	42	50	4 Overcast	R
14	46	49	43		4 Overcast	R

SHELLFISH FISHERY

INTRODUCTION

Prior to 1976 the shellfish fishery was managed more or less by seat of the pants, primarily due to the fact that funding and personnel were not available to provide the necessary information for proper management. Minimum legal size regulations existed for Dungeness crab and razor clams from pre-statehood regulations and were adopted by the State. A minimum legal size for king crab was established with a minimum amount of data and from studies that had been conducted elsewhere. The Tanner crab fishery was in existence five years when an arbitrary quota was established and in existence for nine years before a minimum legal size was adopted.

The adoption of a minimum legal size for Tanner crab in 1976 was the first approach in the management of the Tanner crab fishery.

In 1975 a shellfish research biologist was hired on a temporary basis, and later, in 1976, on a permanent basis. Research studies initiated in 1975 were expanded in 1976 to provide information for a biologically sound management program.

TANNER CRAB FISHERY

INTRODUCTION

Major harvest areas for Prince William Sound Tanner crab are shown in Figure 11. These areas are in Prince William Sound proper and extend into the Gulf of Alaska. Area E is presently divided into two areas with respective guideline harvest levels: "Inside" at 3.5 million pounds, "Outside" at 12 million pounds.

For the first few months of the season, which opens November 15, most of the fishing occurs inside Prince William Sound and Hinchinbrook Entrance by seine type vessels. As the season progresses and the seasonally severe weather conditions improve, larger vessels enter the fishery and the majority of effort shifts to the waters outside Prince William Sound.

HISTORY AND STATUS

The historical catch reached a peak of nearly 14 million pounds in the 1972-73 season. In the 1975-76 season, which was the last season without a minimum size, the total catch was 7.2 million pounds. Historical catch is depicted in Table 25 and Figure 12.

In the 1975-76 season 40% of the catch or approximately 3 million pounds was beneath the new minimum size which became effective for the 1976-77 season. The majority of these crab would have molted once and then entered the 1976-77 fishery as legal crabs; therefore, assuming an increase in weight because of growth, at least 3 million pounds of crab will not be available to the 1976-77 fishery that would be available had the 5.3 inch minimum size been in effect in the 1975-76 season. Historical width frequency catch data is presented on Figure 13. This graphically depicts the historical increase in harvest of "smaller" crabs.

TANNER CRAB RESEARCH PROGRAMS

Brood stock condition - In late May of 1977 the Department will begin an annual research test fishing cruise to determine breeding success. As many females will be caught in as many areas as time allows. As the peak breeding period appears to be in early to mid-May, analysis of sexually mature females shortly after this period will yield breeding success data for that year.

The two prime factors which indicate breeding success are presence of eggs and fullness of clutches. Preliminary information from the Kodiak Tanner crab research program and a University of Alaska Sea Grant biologist indicates that a level of 85 to 90 percent of new shelled sexually mature females should have full egg clutches. A level lower than this may indicate that the brood stock males are not of adequate size for production of full clutches in females after mating.

Male Tanner index and tagging - In parts of August and September, depending on vessel availability and funding, the Department will conduct test fishing for index of abundance and tagging purposes. It is also hoped that, with the small mesh pots that will be used, an index of pre-recruit abundance may begin.

Analysis of data will show relative recruitment into the upcoming fishery and pre-recruit strengths for the following season's fishery.

The tagging is a continuation of the Department's program to determine seasonal movement.



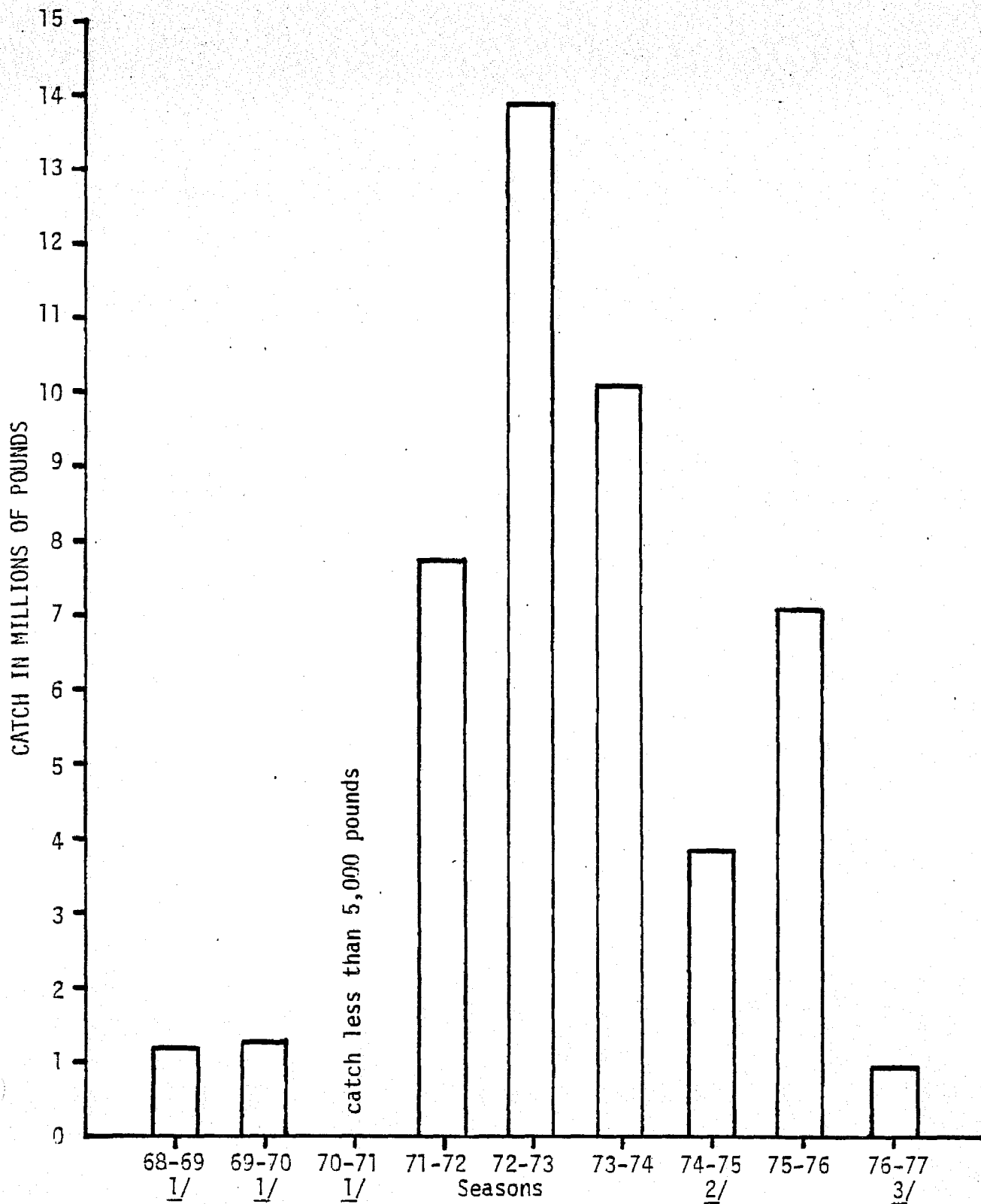
Figure 11. Prince William Sound Area Tanner crab harvest areas.

Table 25. Prince William Sound Area historical Tanner crab catch in pounds by season.

<u>Season</u>	<u>Inside</u>	<u>Outside</u>	<u>Total</u>
1968 - 69			1,235,613
1969 - 70			1,284,597
1970 - 71			4,159
1971 - 72			7,788,498
1972 - 73			13,927,863
1973 - 74	1,658,000	8,500,000	10,158,000
1974 - 75 <u>1/</u>	1,187,000	2,667,000	3,854,000
1975 - 76	3,322,482	3,810,262	7,132,744
1976 - 77	1,165,373	1,155,975	2,321,348

1/ No concentrated effort until February 1975.

Figure 12. Prince William Sound Area historical tanner crab catch in pounds by season.



1/ Exploratory phase of fishery. 2/ Strike curtailed catch. 3/ As of 2/28/77.

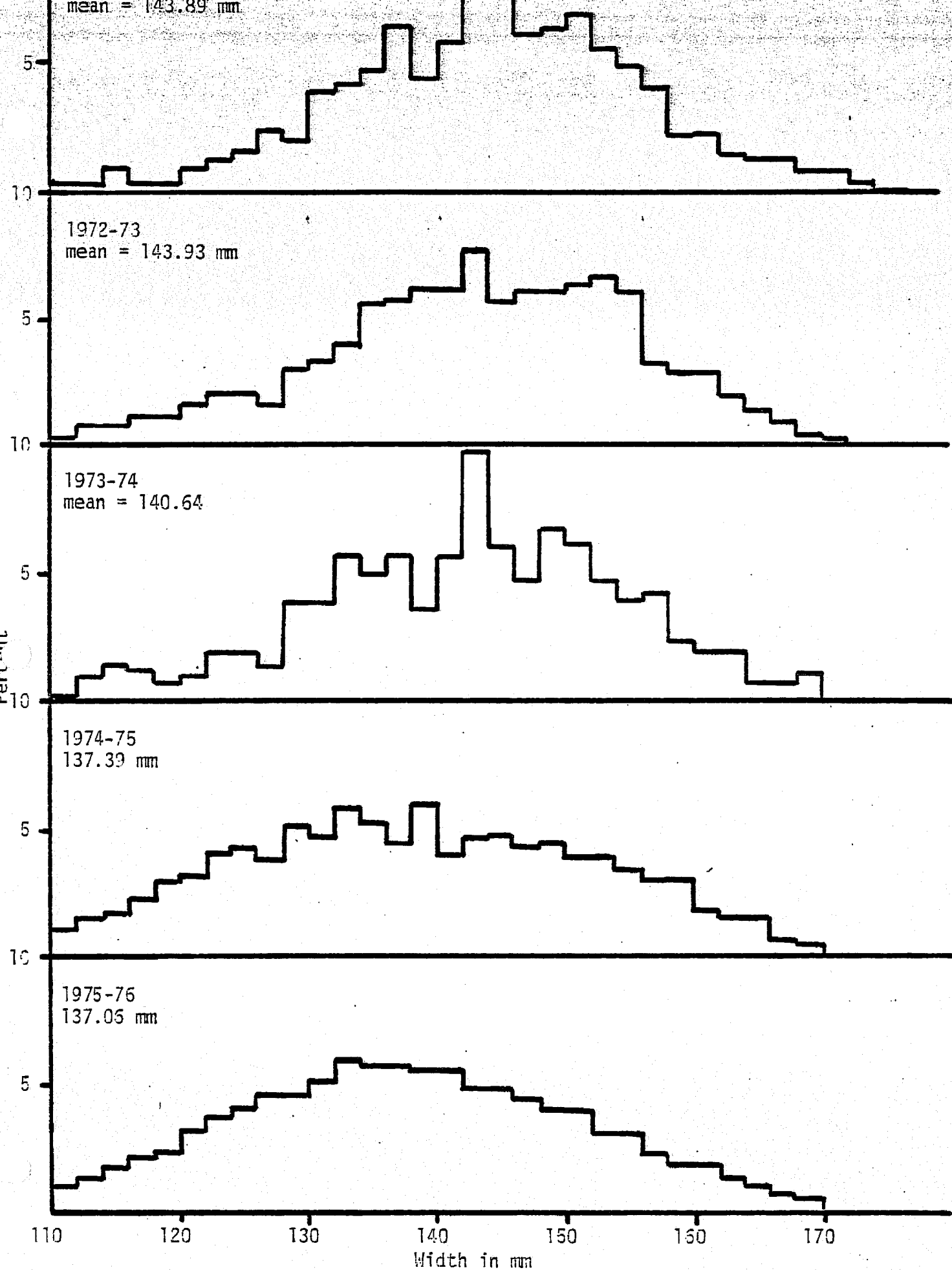


Figure 13. Tanner crab width frequency of historical catch, 1971-72 season through 1975-76 season, Prince William Sound.

DUNGENESS CRAB FISHERY

INTRODUCTION

There are two areas in Prince William Sound where Dungeness crab are commercially harvested: (1) Orca Inlet, and (2) Copper River Flats/Controller Bay, Figure 14.

Orca Inlet, which is immediately adjacent to the community of Cordova, provides a fishery that allows participation by small vessels in an area protected from adverse sea conditions (the largest size class of vessels is in the 21 to 30 feet keel length class). Crab fishermen can leave the harbor in the morning, pick their gear during the day and deliver in the late afternoon.

The Copper River Flats/Controller Bay area, although it is essentially a summer - early fall fishery, is subject to heavier sea conditions, thus requiring larger vessels, 40 feet plus keel lengths, for efficient participation. Run time to and from the crabbing grounds requires at least one day, not including fishing time.

HISTORY AND STATUS

The fishery is strongly influenced by West Coast market conditions. Good seasons in Washington, Oregon and California apparently make it economically impractical for Alaska Dungeness crab to compete on major markets. Therefore, historical catch statistics, Table 26 are not always reliable indicators of stock status.

Orca Inlet - Catch has decreased steadily from a level in excess of one million pounds in 1965 to the 1975 level of 163,000 pounds, Figure 15.

The factors responsible for the declining catch are not conclusively known, but two major changes in the ecology of Orca Inlet that may have had an influence are: (1) uplift caused by the 1964 earthquake and related changes in the shallow water environment may have adversely affected the crab directly or its food source, and (2) food availability to the crab population may have changed when local processors complied with environmental standards in disposing of crab and salmon wastes.

The 1976 catch was 35,000 pounds landed by three vessels. Because of this minimal effort, directly related to West Coast market conditions, the 35,000 pound catch is not in itself an indicator of stock status. However, in 1976 the Dungeness crab research program produced a population estimate of 153,000 pounds for legal males. This estimate, when compared to historical catch data on Table 26 shows a continued decrease in available crab in Orca Inlet.

Copper River Flats/Controller Bay - Until 1969, catch records have included catch from the Icy Bay area. Since Icy Bay is not in the Prince William Sound management area, catch data prior to 1969 is not used in this report. Since 1969 West Coast market conditions are constantly reflected in the catch, especially in 1970 and 1971 when the catches were under 100,000 pounds. In 1975 market conditions were good, and there was apparently good recruitment into the fishery which was reflected in a recent record catch of 654,000 pounds, Figure 16.

In 1976 the legal male population estimate was in excess of one million pounds. The actual catch was 250,000 pounds landed by four vessels. These low catch and effort figures are again a direct reflection of West Coast market conditions, as the few processors who were taking Dungeness crab stopped accepting deliveries once their limited markets were filled.

Analysis of Dungeness crab index data and dockside catch sampling data shows 1976 to have been a recruit fishery. Therefore, because of the relatively small catch in 1976, the number of legal males available to the 1977 fishery should be near the one million pound level.

In 1977 the Department's research program will continue to index and tag in both of the Prince William Sound Dungeness crab fisheries.

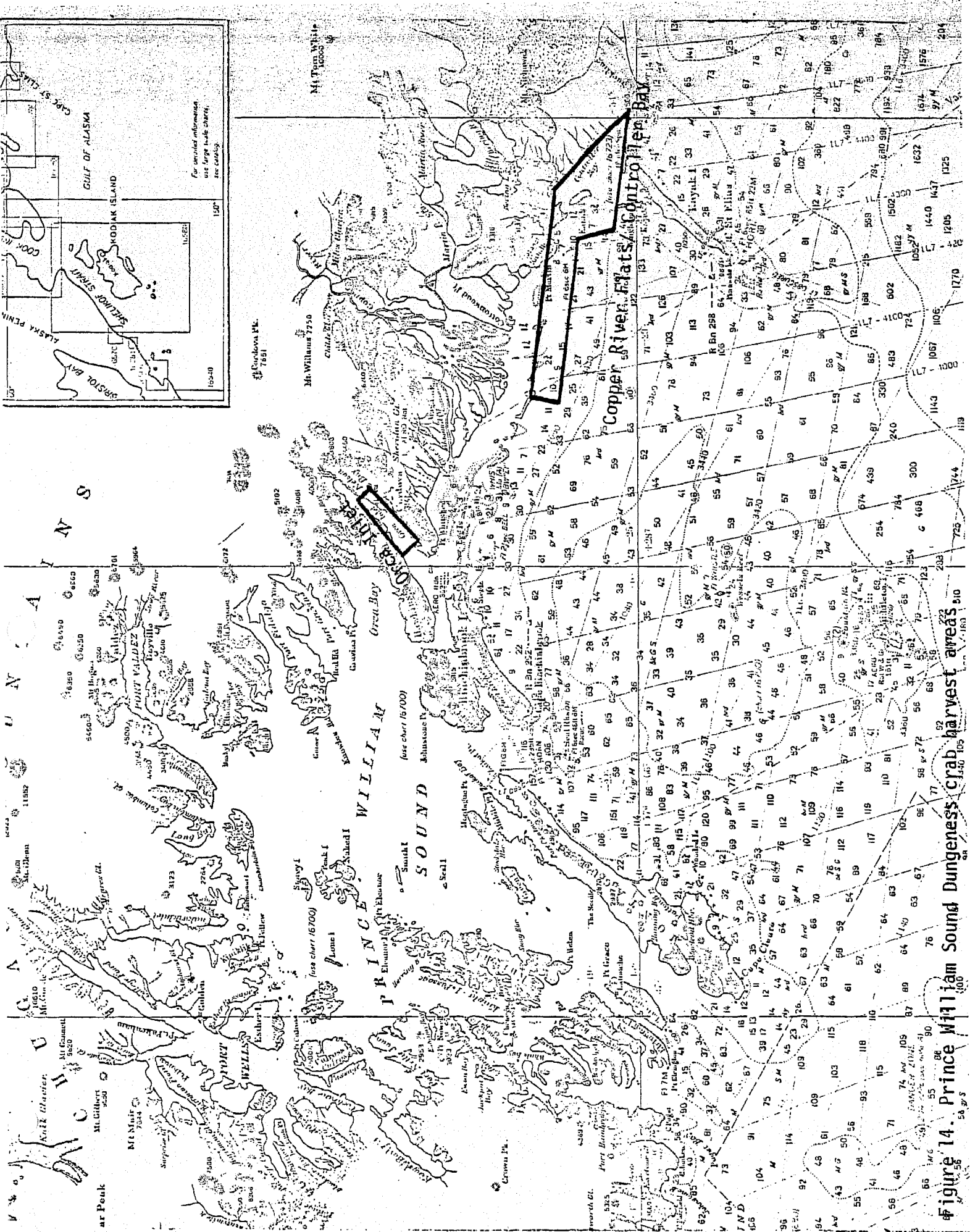


Table 25. Prince William Sound historical Dungeness crab catch, 1960 - 1976.

<u>Year</u>	<u>Copper River Flats/Controller Bay</u> <u>Pounds</u>	<u>Orca Inlet</u> <u>Pounds</u>	<u>Total Catch</u> <u>Pounds</u>
1960	no data available	1,524,326	incomplete data
1961		990,242	
1962		1,353,190	
1963		1,216,846	
1964		1,290,929	
1965		1,240,372	
1966		999,341	
1967	no data available		
1968		579,279	
1969	336,696	541,822	878,696
1970	78,223	660,411	738,634
1971	78,848	430,976	509,824
1972	437,865	286,808	724,673
1973	458,613	347,764	806,377
1974	290,149	269,015	559,164
1975	654,410	163,631	818,041
1976	254,933	35,399	290,332

Figure 15. Orca Inlet, Prince William Sound Dungeness crab catch, 1960 - 1976.

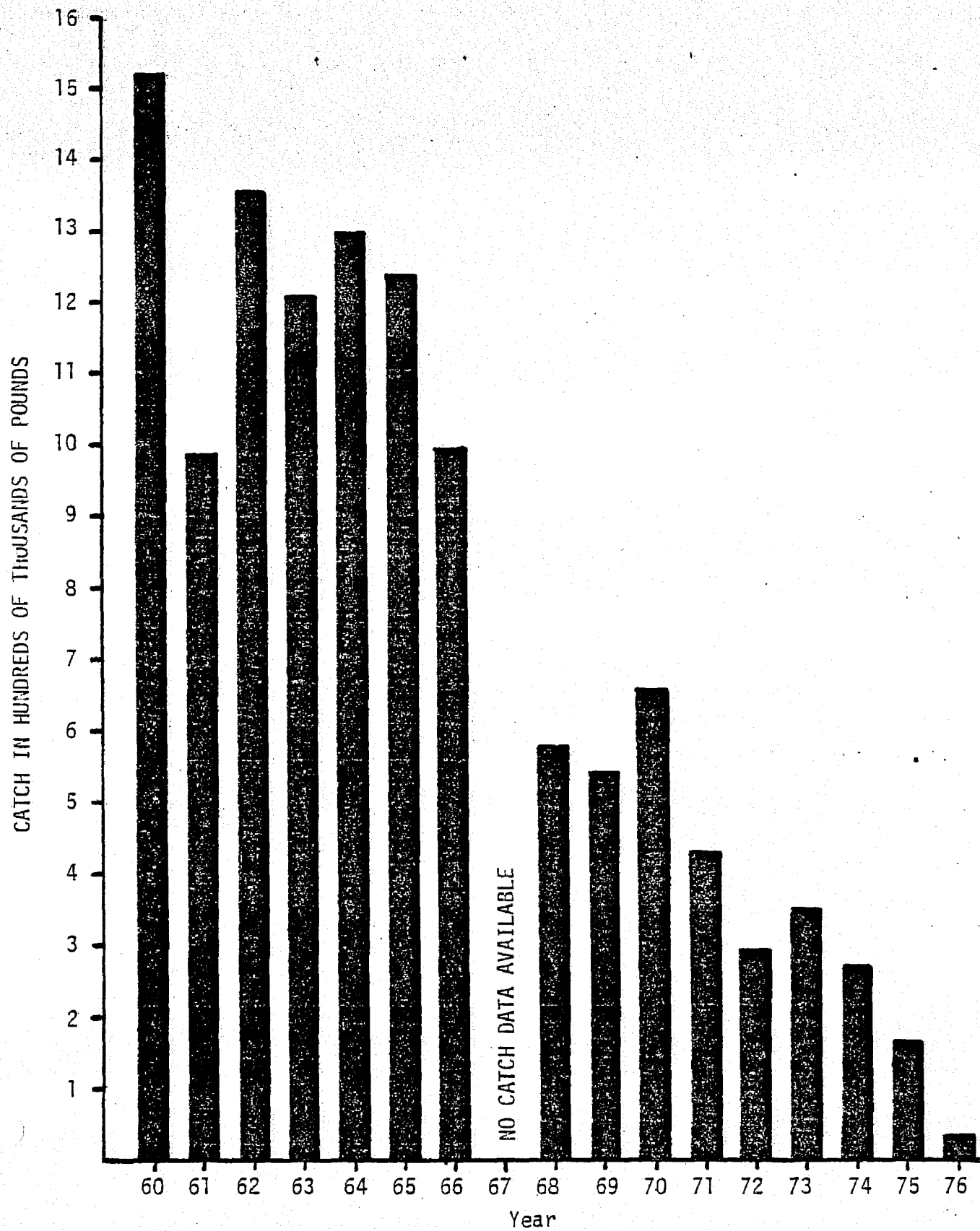
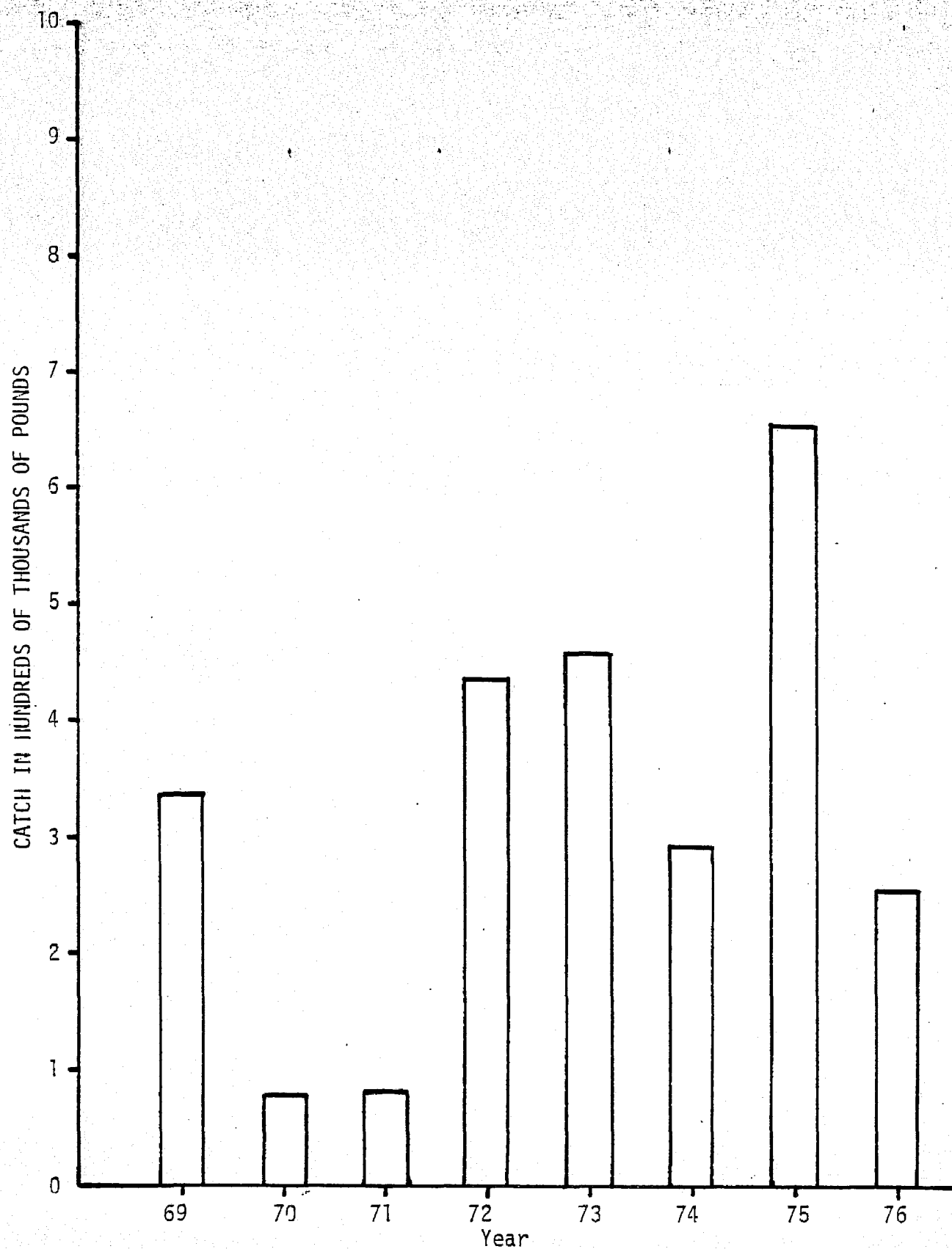


Figure 16. Copper River Flats/Controller, Prince William Sound Dungeness crab catch, 1969 - 1976.



KING CRAB FISHERY

INTRODUCTION

There are two species of king crab fished commercially in Prince William Sound: blue king crab and red king crab. Both the red and blue king crab are fished in the Port Wells/Unakwik area. The red king crab is also fished in the Orca Bay/Port Gravina/Port Fidalgo area, Figure 17.

HISTORY AND STATUS

Most of the 18,000 pounds of king crab landed in 1976 were caught incidentally to Tanner crab. The 1976 catch was the smallest catch since 1966, Table 27 and Figure 18. As the 1976 catch was incidental to Tanner crab, it does not reflect the true status of the red and blue king crab stocks in Prince William Sound. Because of the lack of research information, the true stock status is not known at this time; however, the approximately 300,000 pounds, landed in 1972 appears to be an indicator of the upper range of potential harvest.

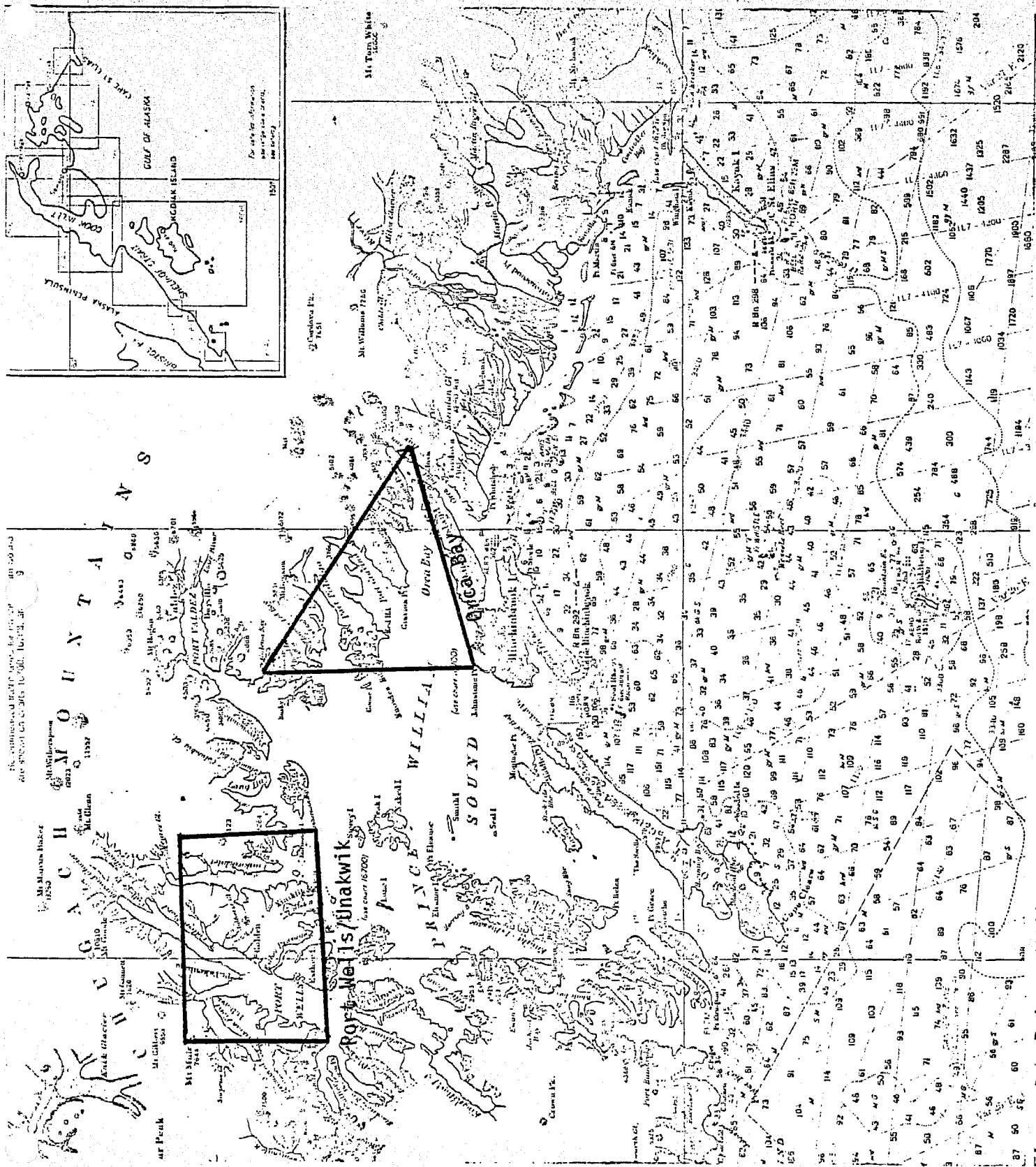
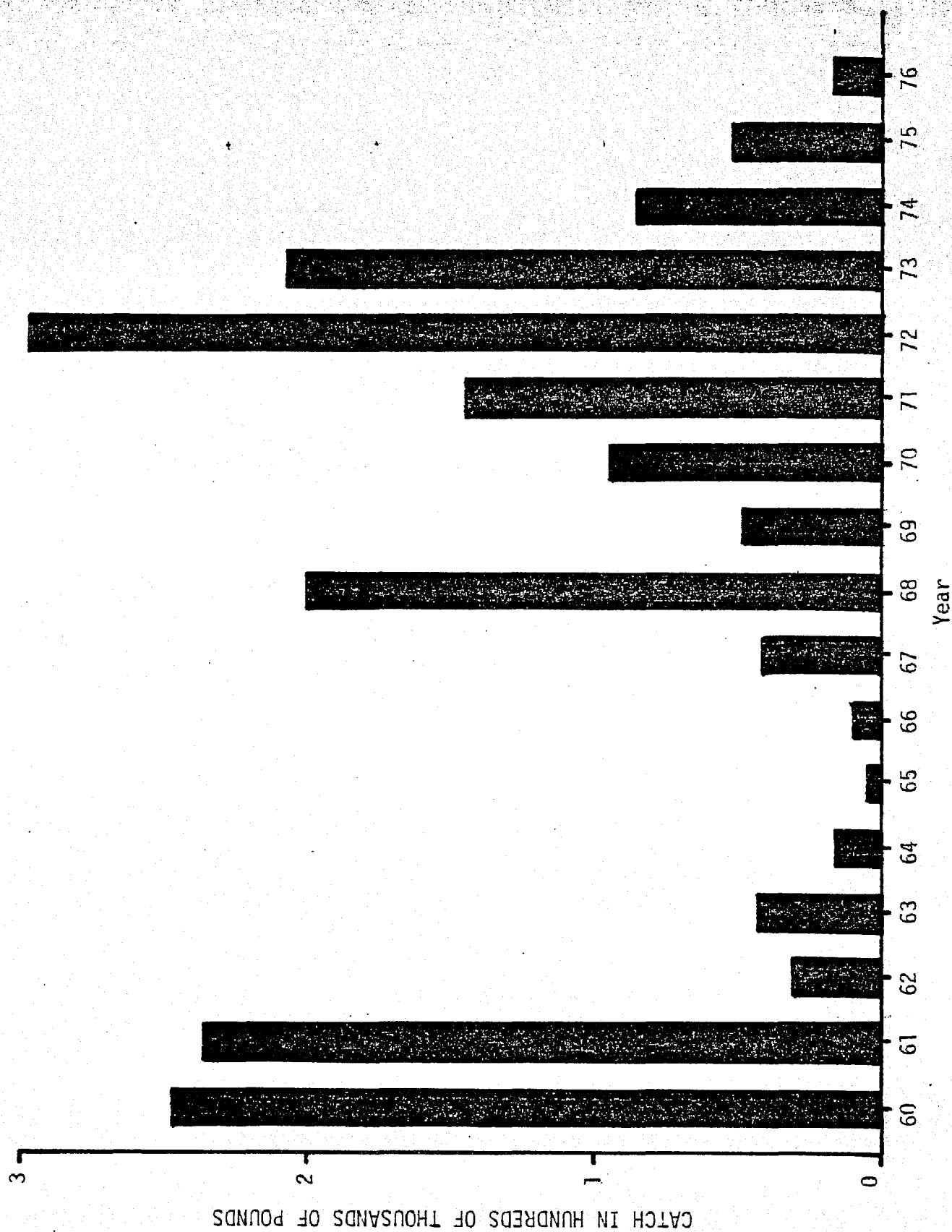


Figure 17. Prince William Sound king crab harvest areas.

Table 27. Prince William Sound historical king crab catch in pounds, 1960 - 1976.

<u>Year</u>	<u>Pounds</u>	<u>Year</u>	<u>Pounds</u>
1960	246,965	1971	144,200
1961	236,081	1972	296,200
1962	31,478	1973	207,916
1963	43,569	1974	85,379
1964	14,028	1975	53,423
1965	5,500	1976	18,023
1966	11,000		
1967	41,800		
1968	200,000		
1969	48,100		
1970	94,300		

Figure 18. King crab catch in pounds Prince William Sound Area, 1960 - 1976.



RAZOR CLAM FISHERY

Areas of historical commercial harvest are Orca Inlet and the Copper River Flats/Controller Bay areas, Figure 19.

In 1976 1,516 pounds of razor clams were harvested commercially. The entire product was frozen for bait.

Historical catch data, Table 28 and Figure 20, shows a marked decrease in the harvest of razor clams. Department research has shown a decreased survival of juvenile razor clams in the Orca Inlet area. This decreased survival appears to be caused by changing substrate in the razor clam habitat. Deposition by the Copper River and the 1964 earthquake are the two major factors influencing substrate change.

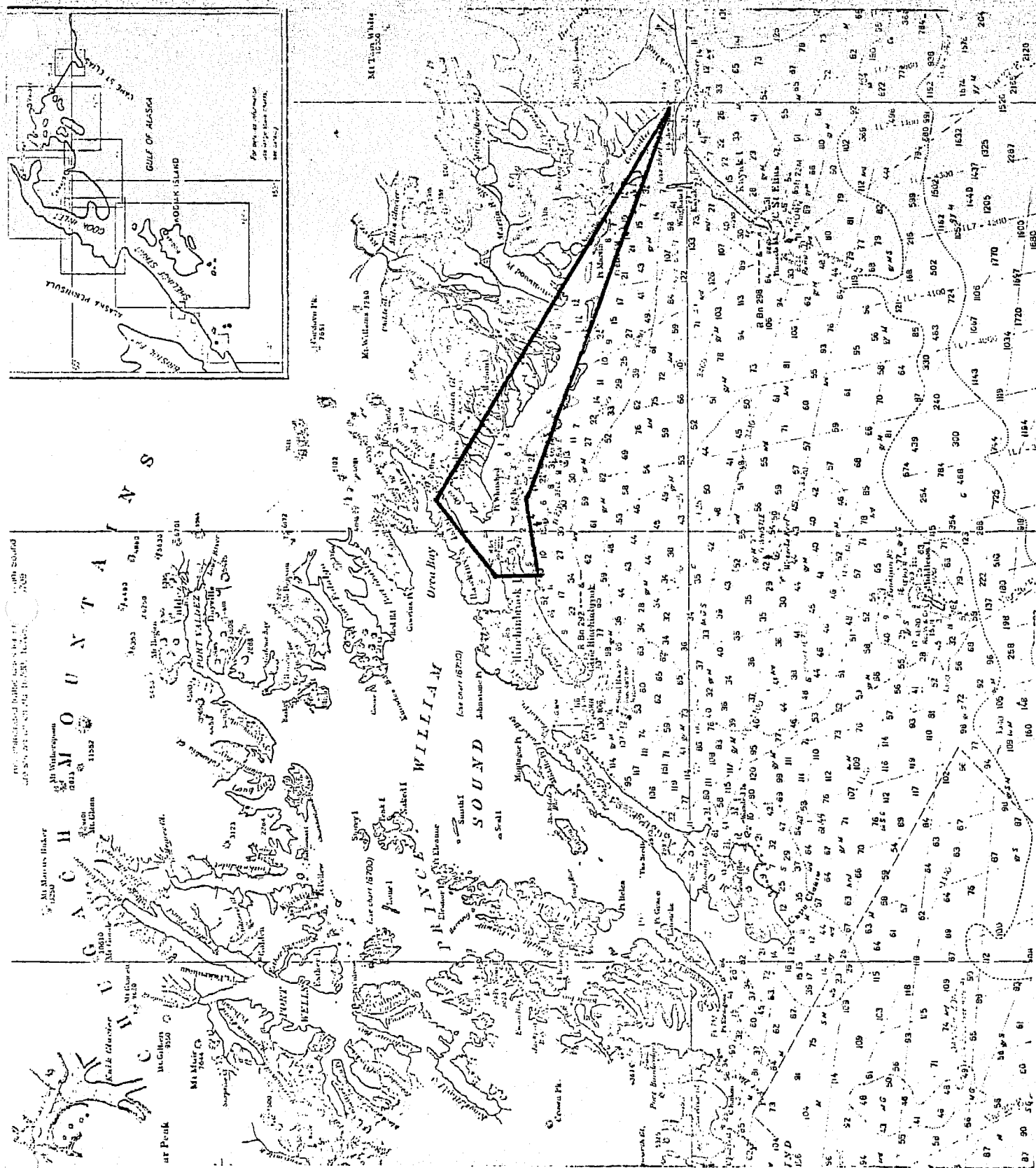
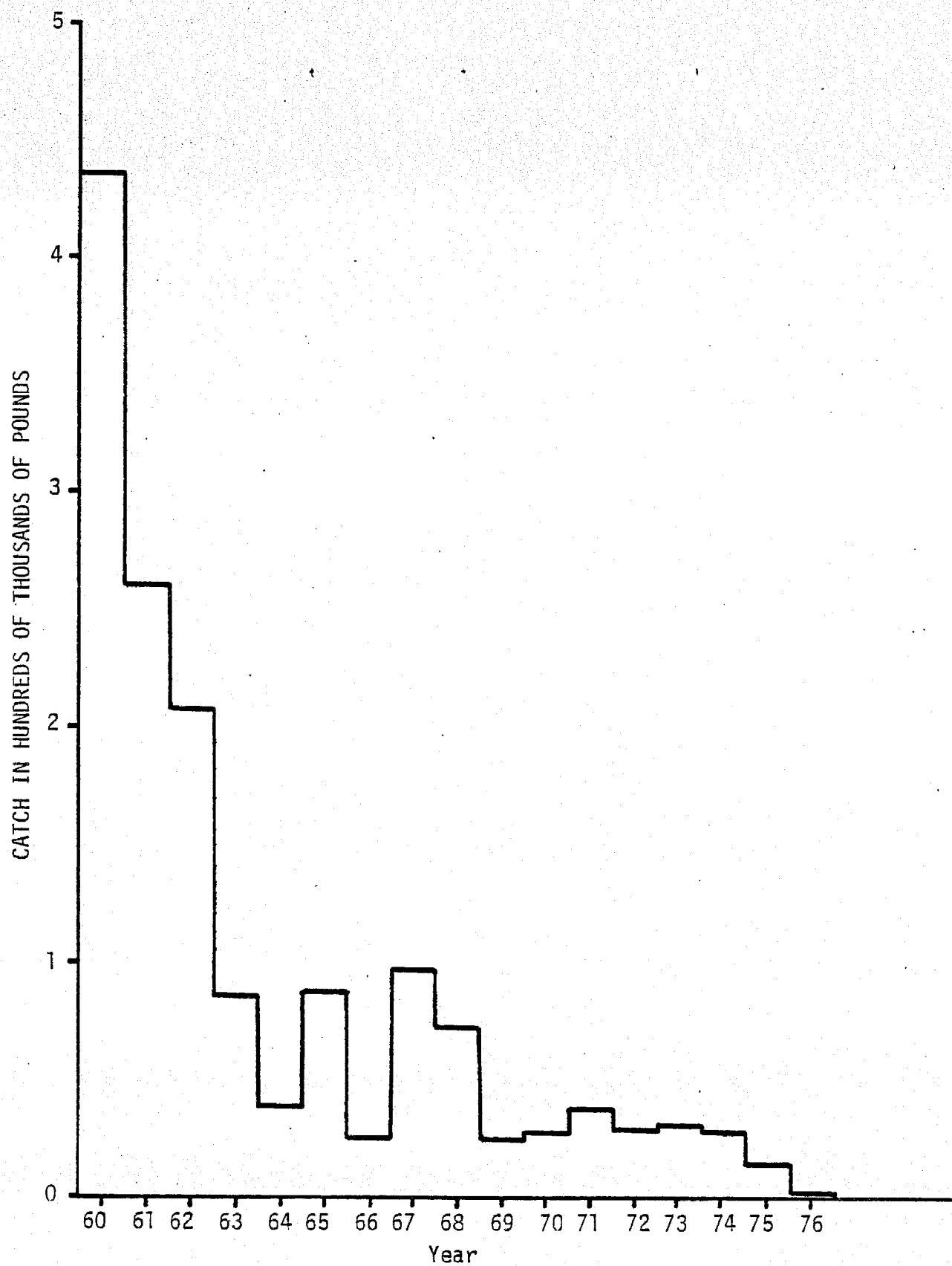


Figure 19. Prince William Sound Area razor clam harvest areas.

Table 28. Prince William Sound historical razor clam harvest in pounds,
1960 - 1976.

<u>Year</u>	<u>Pounds</u>	<u>Year</u>	<u>Pounds</u>
1960	433,930	1971	37,972
1961	261,628	1972	30,826
1962	208,698	1973	30,818
1963	86,340	1974	29,747
1964	39,275	1975	15,443
1965	86,477	1976	1,516
1966	27,063		
1967	98,446		
1968	72,806		
1969	26,887		
1970	27,909		

Figure 20. Razor clam harvest in pounds, Prince William Sound Area, 1960 - 1976.



SHRIMP FISHERY

A small pot shrimp fishery for spot shrimp operates in northern Prince William Sound. The 1976 total pot shrimp harvest was 1,205 pounds.

A small otter trawl fishery for mainly pink and sidestripe shrimp has operated in eastern Prince William Sound for the past few years. The total harvest in 1976 was 2,421 pounds.

In August of 1976 a large shrimp trawl vessel made some exploratory trawls in western Prince William Sound. Although two trips yielded 131,694 pounds of mainly pink shrimp, later attempts in October by four large shrimp trawlers did not yield enough shrimp to deliver.

Historical catch of all shrimp species is shown in Table 29.

Table 29. Prince William Sound historical shrimp harvest in pounds by gear,
1960 - 1976.

<u>Year</u>	<u>Pots</u>	<u>Year</u>	<u>Pots</u>	<u>Trawl</u>
1960	2,494	1971	6,537	
1961		1972	3,474	5,153
1962	1,788	1973	3,185	4,243
1963	550	1974	12,489	1,345
1964	2,124	1975	2,075	26,961
1965	2,178	1976	1,205	134,115
1966				
1967	374			
1968	3,433			
1969	2,573			
1970	9,888			

MISCELLANEOUS FISH

BOTTOM FISH

Bottom fish were harvested from the Prince William Sound Area by both longline and otter trawl, and were reported primarily as "bottom fish general" with no species breakdown. of the total 80,028 pounds, Table 30, reported taken 5,127 pounds were reported as pacific cod and the remaining 74,901 pounds reported as "bottom fish general".

Reports of halibut harvested totaled 545 tons.

Table 30. Bottom fish catch by gear, area, species and statistical area, 1976. 1/

<u>Area</u>	<u>Gear</u>	<u>Species</u>	<u>Pounds</u>
212-10	Long Line	Bottom Fish General	5,900
212-20	" "	" " "	1,150
221-20	" "	" " "	1,495
222-30	" "	" " "	305
224-10	" "	" " "	510
226-10	" "	" " "	2,031
226-30	" "	" " "	766
226-40	" "	" " "	1,375
227-20	" "	" " "	365
227-40	" "	" " "	847
228-70	" "	" " "	5,751
Sub-Total			20,451
222-40	" "	Pacific Cod	51
224-10	" "	" "	268
224-40	" "	" "	962
226-10	" "	" "	363
226-30	" "	" "	2,235
226-40	" "	" "	66
227-10	" "	" "	392
227-20	" "	" "	530
227-40	" "	" "	260
Sub-Total			5,127
221-20	Otter Trawl	Bottom Fish General	1,180
221-30	" "	" " "	56,270
Sub-Total			57,450
TOTAL			80,028

1/ In addition 1,089,375 pounds of halibut were landed.

HERRING SAC ROE AND SPAWN ON KELP FISHERY

HERRING SAC ROE FISHERY

The 1976 herring roe season was somewhat of a disappointment and was the first season since the establishment of the 5,000 ton quota limit that this quota was not obtained.

The staff began monitoring the fishery on April 5 by conducting bi-weekly aerial surveys. Spawning was first observed on April 7, approximately ten days earlier than what was previously recorded. On April 10 another observation of a small spawning school was recorded. Tonnage estimates of herring present in the entire area, spawners and nonspawners, were less than 400 tons at that time.

Because of the increased spawning activity, and what appeared to be the possibility of an early opening of the fishery, the staff began monitoring the fishery from the Department vessel M/V Montague. During the next week search surveys, utilizing hydroacoustical sounding gear were conducted and biological samples for age, weight, length, and sex analysis were collected from spawning stocks.

From April 12 through April 15 herring were observed along beaches in most of the Valdez Arm closed area and were spawning sporadically along these beaches. On April 16 spawning became more intense and precluded any possibility of a season opening in that area. At that time an announcement was made informing the fishermen that no herring fishery would be allowed in the Valdez Arm area.

Immediately after the announcement was made the fishery effort shifted to Green Island for the anticipated season in that area. During the next two weeks the staff continued to conduct spawning surveys of the Valdez Arm area and initiated aerial and hydroacoustical surveys of the Green Island, Montague Island area.

During the initial hydroacoustical surveys herring were located, but were deep and remained unfishable until April 29. On that day approximately 3,000 tons of herring were located by aircraft along the beaches on the west side of Montague Island. Samples for roe recovery calculations were obtained and determined to be 12%, so an announcement to open the season for one hour on April 30, was made.

Although price negotiations between fishermen and processors had been going on for some time a price per ton agreement had not been reached. After the opening announcement had been made another meeting between processors and fishermen was again scheduled and the offered price turned down. As a result, no fishing occurred during the one hour opening. Successive one hour opening announcements were made for the next two days, but fishermen demands were not met and the fishing fleet remained at anchor.

On May 5 a price settlement of \$175/ton was agreed upon, but the herring that were once available moved off the beaches back into deep water and began to feed quite actively.

On May 7 the herring began to move onto the beach areas of Green Island. During the morning of May 8 roe recovery samples were again obtained, and an announcement to open the season for one hour the following morning was made.

After the one hour opening on May 9 reports received from tenders indicated that approximately 2,600 tons of herring had been harvested. Actual tonnage compiled from fish tickets at a later date ascertained that 2,167.68 tons of herring were taken by 66 boats. The total number of fishing boats on the fishery grounds is not known. Many boats made seine sets, but did not get fish or had their seines torn on rocks and lost fish, or did not get to set before the closure because of gear congestion. Originally, 103 seine boats and 53 tenders were counted in the Valdez Arm area in early April, but by May 9 many boat owners had become discouraged either by the self-imposed strike or by the late show of herring stocks and had departed the fishery.

Some buyers continued to prospect for herring stocks in other Prince William Sound districts after the Green Island closure. In conforming with the guideline harvest level regulation, the staff monitored reported observations and checked roe recovery from several samples taken in other areas of the Sound. On June 6 a 12 hour opening was announced in the Eastern district which resulted in a harvest of 416.5 tons of herring by the 12 seine boats that participated in this fishery. Table 31 presents the herring harvest in tons from 1967 through 1976. Figures 21 and 22 show areas of herring spawning in the Valdez Arm and Green Island areas. Tables 32, 33, and 34 give age, sex and size compositions of herring samples collected from spawning areas while Figure 23 presents comparative age analysis for the years 1973 through 1976. Figure 24 shows harvest data for 56 years.

SUMMARY

The 1976 herring season presented several unanticipated management problems. Herring utilizing Valdez Arm spawning areas began spawning as they appeared on the spawning grounds. Although no decrease in the herring populations was apparent when compared with past years' estimates, the sporadic spawning and the slow buildup of unspawned fish prevented the staff from making an emergency announcement opening the season in this district.

If an announcement had been made opening the season it is doubtful whether or not a fishery would have occurred due to fishermen and processors price negotiations taking place at that time.

The increased number of boats participating in the fishery dictated the staff to manage the fishery by shortened periods in an effort to keep the catch within the harvest level limits. This resulted in many fishermen not fishing during the Green Island opening.

HERRING SPAWN ON KELP FISHERY

Herring began spawning in the Valdez Arm area on April 7 and continued to sporadically spawn until April 16 when peak spawning appeared to occur. On April 21 after several days of herring spawning the herring spawn on kelp season was opened.

During the season the Virgin Bay area of Tatitlek Narrows was not opened to the harvest of kelp. This particular area had been harvested quite heavily during the 1974 - 1975 seasons, and the staff wanted this area kept closed to evaluate the effects of those harvests. The Bidarka Point area also remained closed in 1976 to enable biologists to conclude a two year study on growth and re-establishment of kelp in a previously harvested area.

Kelp quality during the season was not particularly good. Egg cover was reported to be poor, and deliveries were culled severely by many buyers. However, considering the undesirability of the product and the closure of Virgin Bay, one of the more previously productive areas, 242.5 tons of spawn on kelp were harvested by 358 kelp harvest permit holders, Table 31.

HERRING RESEARCH

Herring research in Prince William Sound consists of ongoing programs in hydroacoustical assessment of overwintering herring stocks during the winter months, biological sampling of the commercial catch for age, length, and sex structures of harvested populations to assess overall condition and recruitment of herring into the commercial fishery; beach and air surveys of spawning areas to determine relative magnitudes of spawning intensity and egg deposition; and a project just completed which has evaluated effects of harvesting kelp by present methods, and the growth recruitment of kelp in areas of intense kelp harvests. Results of this study will be published in a separate report upon completion of the data analysis.

Table 31. Herring and herring spawn on kelp in tons from Prince William Sound, 1967 - 1976.

<u>Year</u>	<u>Bait</u>	<u>Used for Roe</u>	<u>Spawn on Kelp</u>	<u>No. Boats</u> <u>1/</u>
1967	30			
1969		355.7	2.7	6
1970	10		95.2	1
1971	20.03	919.2	384.7	14
1972	8.96	1,768.3	299.7	15
1973		6,983	153.2	28
1974		6,371	276.1	72 <u>2/</u>
1975	226.7	5,853.8	458.5	76
1976 *		2,584.2	242.5	61

1/ Number of herring fishing boats making actual deliveries.

2/ Also three drift gill net boats.

* Preliminary.

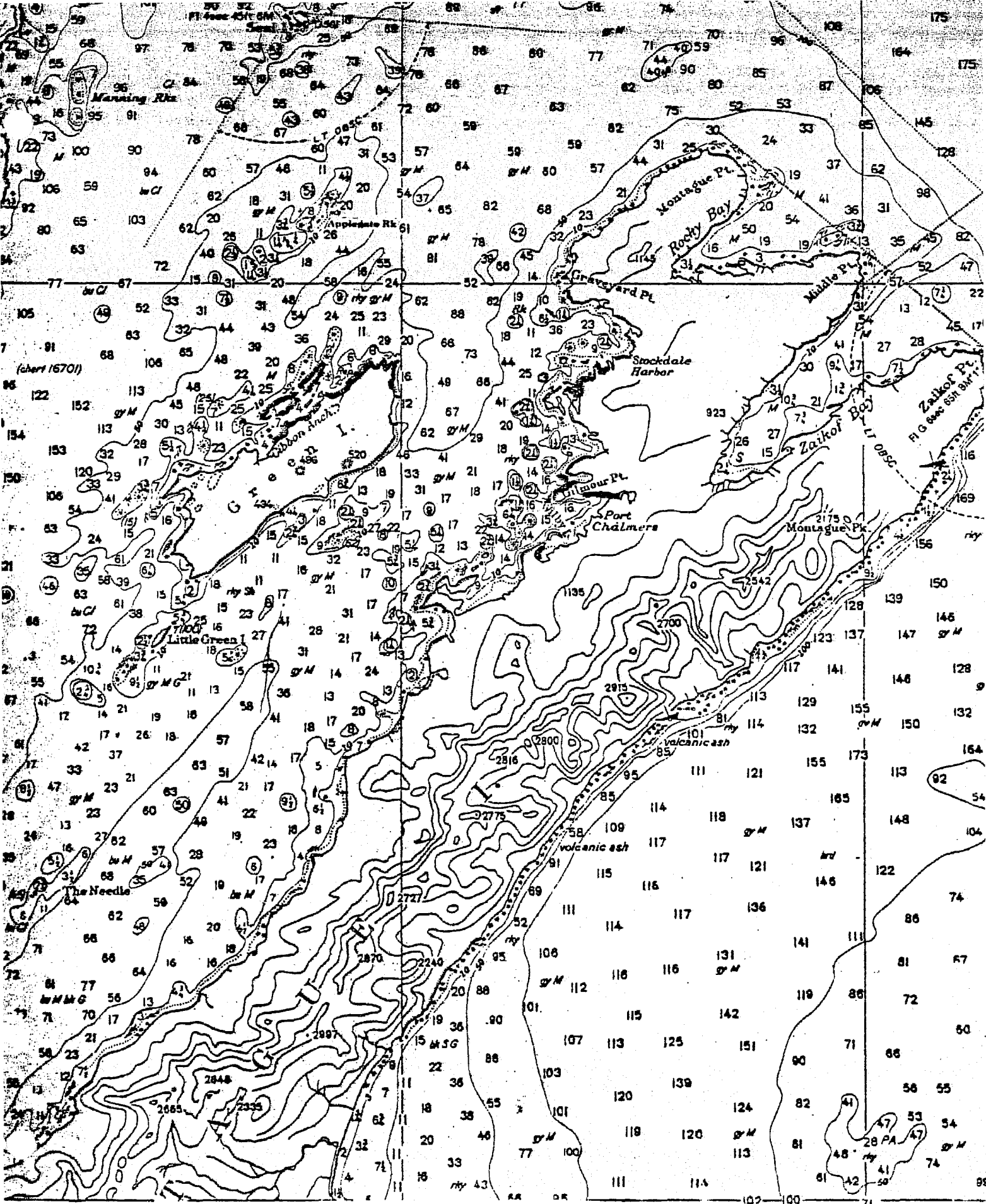


Figure 22. Areas of herring spawning in the Montague district, Prince William Sound, 1976.

Table 32. Age, sex, and size composition of 325 herring collected by variable mesh gill net from spawning areas, Valdez Arm, Prince William Sound, Alaska, April 12 through April 16, 1976.

Age Group	Year class	MALES			FEMALES		
		Frequency No.	%	Mean lgth. mm wt. gm	Frequency No.	%	Mean lgth. mm wt. gm
III	1973	1	.5	160.0 60.0			
IV	1972	20	10.8	194.3 102.1	21	15.1	194.1 107.1
V	1971	65	35.0	199.7 110.6	32	23.0	211.2 134.8
VI	1970	79	42.5	212.9 130.0	55	39.6	213.0 138.1
VII	1969	18	9.7	217.9 150.3	22	15.8	225.1 163.3
VIII	1968	2	1.1	237.5 180.0	8	5.6	234.8 182.2
IX	1967	1	.5	239.0 170.0	1	.7	232.0 232.0
TOTALS		186			139		
AVERAGE LENGTH				206.9			213.0
AVERAGE WEIGHT				122.6			138.2
SEX COMPOSITION				57% males:43% females			

Table 33. Age, sex, and size composition of 289 herring collected from the commercial fishery at Green Island, Alaska, April 30, 1976, May 8 & 9, 1976.

Age Group	Year Class	MALES				FEMALES			
		Frequency No.	%	Mean		Frequency No.	%	Mean	
				lgth. mm	wt. gm			lgth. mm	wt. gm
III	1973	10	6.5	156.0	55.0	6	4.5	178.7	81.3
IV	1972	22	14.2	184.6	88.2	13	13.4	185.3	116.7
V	1971	39	25.2	199.0	113.2	43	32.1	197.7	118.8
VI	1970	75	48.4	205.4	123.3	60	44.8	205.2	132.2
VII	1969	9	5.8	213.8	148.0	5	3.7	215.0	155.6
VIII	1968					2	1.5	221.5	173.0
TOTALS		155				134			
AVERAGE LENGTH				197.6				199.6	
AVERAGE WEIGHT					112.8				125.0
SEX COMPOSITION				53.6% males:46.4% females					

Table 34. Age, sex, and size composition of 113 herring collected from the purse seine fishery at Gravina Bay, Prince William Sound, Alaska, June 6, 1976.

Age Group	Year Class	MALES			FEMALES			Combined Percent
		Frequency No.	%	Mean lgth. mm wt. gm	Frequency No.	%	Mean lgth. mm wt. gm	
III	1973	5	17.9	154.2 49.0	8	10.5	172.8 63.7	12.4
IV	1972	15	53.6	170.2 64.7	20	26.3	176.9 82.0	33.7
V	1971	2	7.1	182.5 73.5	12	15.8	177.9 83.2	13.5
VI	1970	1	3.6	198.0 124.0	12	15.8	203.8 123.2	12.4
VII	1969	4	14.2	199.2 99.5	18	23.7	208.3 146.1	21.2
VIII	1968				6	7.9	213.3 151.8	5.8
IX	1967	1	3.6	225.0 159.0				1.0
TOTALS		28			76			
AVERAGE LENGTH				175.3			191.3	
AVERAGE WEIGHT				73.0			107.5	
SEX COMPOSITION				26.9% males:73.1% females				

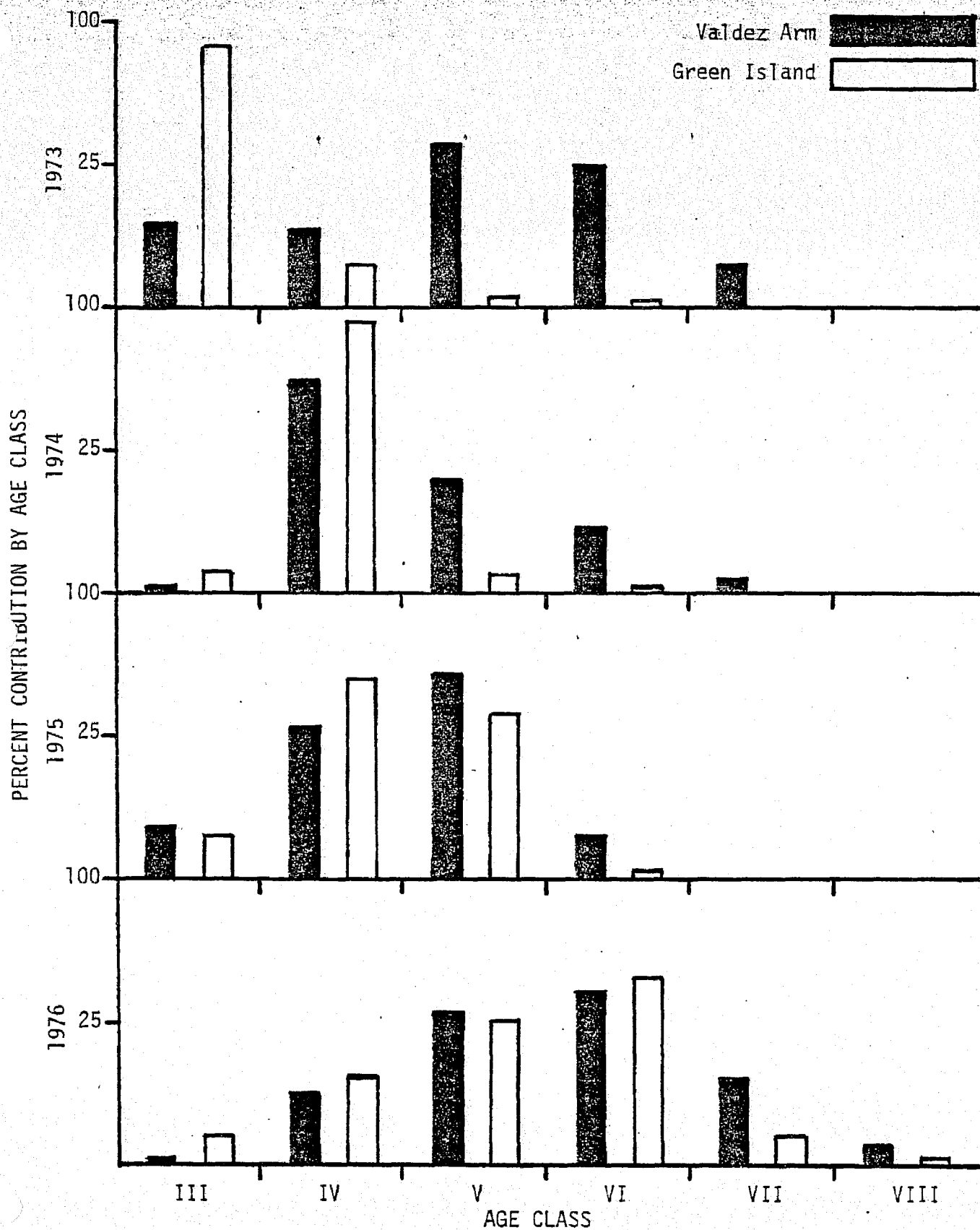


Fig. 23. Prince William Sound herring age class contributions from the commercial fishery, 1973 - 1976.

CATCH IN TENS OF THOUSANDS OF TONS

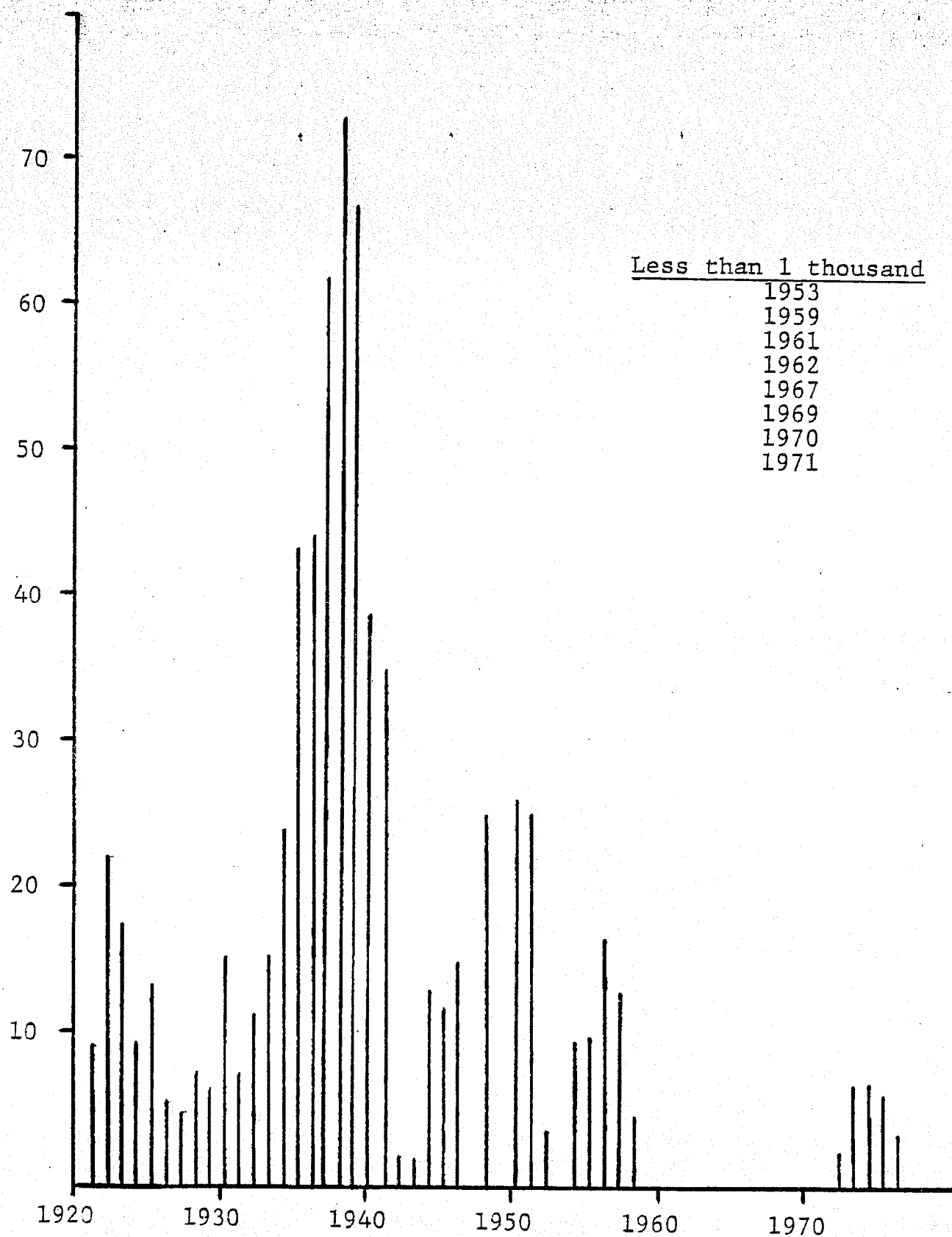


Fig. 24. Annual harvests of Prince William Sound herring.

COMMERCIAL LICENSE SALES

Commercial fishing license sales in 1976 showed an overall increase of \$12,490 over 1975 sales. The sales reflect an increase in commercial (personal), vessel, drift gill net, purse seine, long line, beam trawl and otter trawl gear with shellfish pot, shovel and set gill net gear showing a decrease over the previous sales.

License sales for 1976 are shown in Table 35.

Table 35. Summary of commercial fishing Licenses and receipts, 1976.

Type of Licenses	No. Licenses Issued		Total Issued	Value		Total Value
	Resident	Nonresident		Resident	Nonresident	
Commercial	1303	661	1964	\$13,030	\$19,830	\$32,860
Vessel	736	215	951	7,360	6,450	13,810
Drift Gill Net	399	125	524	5,985	5,625	11,610
Purse Seine	221	60	281	11,050	9,000	20,050
Set Gill Net	8	1	9	80	30	110
Clam Shovel	73	6	79	365	90	455
Shellfish Pots	95	6	101	1,890	630	2,520
100 pots	(75)	(1)	(76)	(1,125)	(45)	(1,170)
200 pots	(15)	(2)	(17)	(450)	(180)	(630)
300 pots	(03)	(3)	(06)	(135)	(405)	(540)
600 pots	(02)		(02)	(180)		(180)
Troll	9	0	9	135		135
Long Line	96	4	100	2,400	200	2,600
Otter & Beam Trawl	5	0	5	250		250
Scallop Dredge	1	0	1	50		50
Totals *	2946	1078	4024	\$42,595	\$41,855	\$84,450

* An additional \$210 was received in license transfer fees.